BITS computing & communications

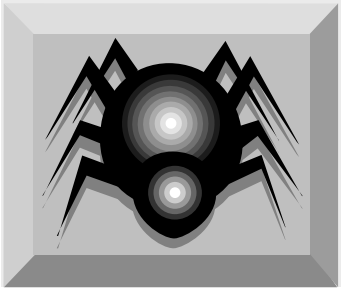
SECOND EDITION

Introduction to Computing at Los Alamos

SUMMER 1997

COMPUTING, INFORMATION, AND COMMUNICATIONS (CIC) DIVISION • LOS ALAMOS NATIONAL LABORATORY

Inside this issue



This friendly spider indicates a connection to either the Laboratory network or the World Wide Web (WWW, Web). When you see the spider icon, look for a path name such as Computing at LANL/Welcome to the Integrated Computing Network or a Web address such as http://www.lanl.gov. Further directions for using the Lab networks and the WWW are contained in this document.

CIC Division is implementing an Integrated Management Process (IMP) to improve its operations. The figure (below) illustrates how the various division-wide processes (assessment, strategic planning, business planning, and operations) are being integrated into a continuous process that cycles through the fiscal year.

Last year, we involved customers, employees, and CIC leaders in a Baldrige criteria-based assessment of the division. This year, CIC Leaders formulated draft strategies based on input from the assessment, white papers, employee feedback from the Checkpoint survey and the implied employment contract, information on competitors/collaborators, and results of the 1995 strategic planning session. The CIC leaders assigned each of the strategies to a division management focus team. New teams were formed to address strategies for which a focus team did not exist. Our current strategies and tactics are on the Web at http://www.lanl.gov/Internal/divisions/cic/stratplansum.html. In turn, these goals and tactics will be included in group and division business plans and will be reflected in all division operations.

IMP will provide a more coherent process for conducting business by

- *Increasing the probability of making the right decisions;*
- *Integrating change planning, business planning, operations, quality initiatives, and self-assessment;*
- *Driving the business based on facts, such as customer needs, technology directions, corporate intelligence, and self-assessments;*
- *Linking budgets and resources to strategic goals through identification of objectives and prioritization;*
- *Supporting a "learning organization," characterized by a strategic management perspective and an ongoing focus on improving the quality of administrative and technical management; and*
- *Providing stability in a changing environment.*

In time, this integrated approach will be replicated at group and team levels so that it becomes the way we conduct all operations throughout the division —in a business-like and customer-focused manner.

Hassan Dayem, CIC Division Leader

TABLE OF CONTENTS

Acronym	Meaning
ACFS	Advanced CFS Interface
ACL	Advanced Computing Laboratory
ACS	Account Control System (for the ICN)
ADSM	Adstar Distributed Storage Manager
AIX	IBM version of UNIX, a computer operating system
BSD	Berkeley Software Design, Inc.
CCF	Central Computing Facility
CFS	Common File System
CFSGW	CFS gateway access
CGS	Common Graphics System
CIC	Computing, Information, and Communications (Division)
CLAMS	common Los Alamos mathematical software
CPU	central processing/processor unit
CSC	Customer Service Center
CSSO	Computer Systems Security Officer
DEC	Digital Equipment Corp.
DGL	Distributed Graphics Language
DNS	domain name system
DoD	Department of Defense
DOE	Department of Energy
EI	Employee Information (Labwide System)
ESD	Electronic Software Distribution
EWP	Electronic White Pages (formerly EMR)
FTP	file transport/transfer protocol
GUI	graphical user interface
HP	Hewlett Packard
HPF	High Performance Fortran
HP/UX	Hewlett Packard version of UNIX
HTML	hypertext mark-up language (for the Internet)
I/O	input/output
IA	Information Architecture
IA	Labwide administration services machine
IB	Labwide administration services machine
ICN	Integrated Computing Network
IES	Import/Export Service
IMP	Integrated Management Process
IMSL	International Mathematical & Statistics Library
IP	Internet protocol
ISDN	Integrated Services Digital Network
JIT	just-in-time
LAN	local area network
LANL	Los Alamos National Laboratory
lhost	your local workstation
LPQ	line printer queue
LPR	line print request
LPRM	line printer/remove files
LSF	Load Sharing Facility
LWW	Library Without Walls
MIMD	multiple instruction, multiple data
MPI	message-passing interface
MPP	massively parallel processor
NFS	network file server
NOC	Network Operations Center
OCSR	Organizational Computer Security Representative
ONCS	Open Network Compute Server (Cluster)
PAGES	Print and Graphics Express Station
PDF	portable document format
PE	processing element
PIN	personal identification number
POP	post office protocol (E-mail)
PAGES	Print and Graphics Express Station
PPAGES	printing command for PAGES file shipper
PPD	PostScript printer description
PPP	point-to-point protocol
PVM	Parallel Virtual Machine
RAID	redundant array of inexpensive drives
RAM	random-access memory
rhost	remote computer (not your local workstation)
SGI	Silicon Graphics, Inc.
SIMD	single instruction, multiple data
SLIP	serial line Internet interface protocol
SNCS	Secure Network Compute System (Cluster)
SPARC	scalable processor architecture
SRAM	static random access memory
TA-3	Technical Area 3
T3D	massively parallel supercomputer
TIG	terminal Internet gateway
TMC	Thinking Machines Corporation
UID	UNIX user identifier
UNICOS	Cray version of UNIX
URL	universal resource locator (Web address)
VMS	Virtual Memory System
VR	virtual reality
VTERM	VT100 Terminal Emulation
Web	World Wide Web
WWW	World Wide Web

Computing at Los Alamos National Laboratory (LANL) for the Uninitiated

If you are a new employee or contractor at LANL and need to use a computer to get your job done, it may seem like there is a lot to learn and do before you can get started. If you are an experienced computer user, it may be easier, but there will still be some areas of knowledge or expertise that you will need. Becoming productive within the LANL computing environment is not always easy and straightforward. This publication is meant to improve that situation.

More than likely, when you arrive at a new position, you will already have most of the computing environment defined for you. If you are to have a computer, one will probably be waiting for you. (In fact, the Lab average indicates that many people will have two or more.)

Most workstations are connected to some form of network (there are many different types of connections), and some are not networked at all (they just work as stand-alone machines). The computing environment provided by the Computing, Information, and Communications (CIC) Division is referred to as the Integrated Computing Network (ICN). It includes large centralized computers, Labwide networks and connectivity, and workstation capabilities.

The reasons for this variety are quite simple:

- First, the Lab is a BIG place geographically, and it is expensive to run cables everywhere. This means that over the years some parts of the Lab have become more updated in communications technologies than others.
- Second, the computing facilities at various places in the Lab were never on a par (i.e., the weapons programs serving the Lab's primary mission tended to receive the more advanced services and facilities).
- Third, in the age of VAXes and other large-sized computers, many groups and divisions established local computing centers and, consequently, established their own standards for hardware, software, and communications.
- And, lastly, the culture of Los Alamos has always paralleled research and university cultures and has had no centralized, standardized, institutional philosophy of who ought to buy what in hardware, software, and communications.

So computing environments at Los Alamos grew in various and sundry ways, rates, and directions.

To improve this situation, two major initiatives are moving LANL toward a more uniform environment.

- The first is "LANLNet," a five-year project to rewire much of the Lab to ensure a consistent standard of communications, from the port on the wall to the networking infrastructure.
- The second is the Information Architecture (IA) Project, which is a Laboratory-wide effort to address standardization of our computing, information, and communications. This effort has resulted in design guidelines, hardware and software standards, and unified processes that help create an integrated environment.

These and other factors are moving the computing environment toward becoming more interoperable, compatible, and universal.

To help you get started, see the tables in Section 1.2 that provide a checklist for the resources, facilities, or capabilities you may need. Use the information in this publication to assist in accomplishing these tasks.

Most groups or divisions have one or more people assigned to assist users with computer problems. This person, often called the "local system administrator," "network administrator," or "computer person," may be from CIC-2 Desktop Support or a member of your own group or division. Check with your group to find out who this person is because he/she is responsible for helping you with much of your setup for using computing resources.

That's a thumbnail sketch of what may lie ahead for a new computer user at LANL. The following pages have a tremendous amount of information and may tend to overwhelm anyone who is new to LANL. However, it is all important, and this quantity of information is just the result of having a place in which a lot of things have happened in the past, and in which great things are happening in the present. Please wander through the information as you need and don't hesitate to call the CIC Customer Service Center (CSC) at 5-4444 to get help.

Don Willerton
CIC-6 Group Leader

1. ENTERING THE LOS ALAMOS COMPUTING ENVIRONMENT

1.1. About this Publication

The use of computers is becoming an increasing part of doing business at Los Alamos. While they enable us to do many more tasks, computers also may present problems, especially for new and occasional (casual) users. This publication will help make the transition to the Los Alamos computing environment quicker and more productive while reducing stress and confusion. It is designed to provide an overview of the primary computing resources and to serve as a road map to additional information.

A computer application known as the World Wide Web is the primary repository for information at the Laboratory. Each section of this publication will provide references to Web locations that will enable you to broaden your knowledge. Within this publication, the Web location is referenced from the LANL Home Page using a path name such as

Computing/Welcome to the Integrated Computing Network

or to a Web universal resource locator (URL) such as

http://www.lanl.gov

Later in this publication you will be shown how to set up your Web browser to access a Web URL directly [Section 5.5].

The Los Alamos computing environment can be segmented into several special interest groups. This publication is composed of seven areas to help direct you to those resources that are of primary interest to you, as follows:

- Introductory information to help establish terminology, understand your computer security responsibilities, and locate supporting resources such as the various help desk organizations [Section 1].
- How to determine your networking requirements [Section 2].
- Desktop hardware and software support and where and how software distribution and configuration are accomplished. Most users, particularly those of business systems should refer to this section [Section 3].
- Information needed to work in the Integrated Computing Network (ICN) environment and how to use the validation, registration, authentication, and charging mechanisms. Most scientific computing users and those who have explicit networking needs should refer to this section [Section 4].
- Information needed to use the common computing resources at Los Alamos. If you have storage or printing needs, you will find this information helpful [Section 5].

- An introduction to the use of Labwide Business Information Systems [Section 6] where most administrative computer applications are provided.
- An introduction to the use of scientific computing resources [Section 7].

There are three major realms of computing functions at Los Alamos, as follows:

- The “Internet Only” realm is where you can use the Web, get E-mail, run computer programs locally, print to local printers, run desktop software, etc., and don’t have to use an ICN password, a secure identification card (Smartcard), or any other authorizations. This realm looks like a home computer that’s tied to the Internet through an Internet provider.
- The “Administrative” realm allows you to access the administrative computers, institutional data, the LANL data warehouse, and all of the so-called Labwide functions, like Time and Effort, Property Database, Employee Information, Data Warehouse, Travel, and many others. You will probably need a Smartcard and an ICN password for these functions.
- The “Compute Server” realm is focused on providing you with the large machines like Cray YMPs, CM-200s, and workstation clusters. The descriptive words are “lots of cycles,” “lots of storage,” and “lots of bandwidth.” You’ll need an ICN password for these.

The computing resources are divided into the “open” and “secure” environments. These are physically separate networks where classified computing can be performed only on the secure side. For the secure side, you’ll need a secure ICN password.

Beyond this capability, some individuals may need to access the Advanced Computing Laboratory (ACL) (665-7451) for research in advanced computer architectures or networking or to connect with the Grand Challenge programs .

You will be sharing the ICN with a large user community that includes Laboratory employees, visiting staff members, and people working at other facilities on diverse research efforts. This user community has a constantly expanding variety of application and performance requirements that make it necessary to provide support for a wide range of hardware and software.

Many of the resources of the ICN are located at Los Alamos in Technical Area-3 (TA-3), Buildings SM-132 and SM-1498 (the Central Computing Facility—CCF). The ICN and the computing resources it provides are supported and maintained by CIC Division.

1.2 Getting Started

To help you get started Tables 1.1 and 1.2 provide a checklist for the resources, facilities, or capabilities you may need. Use the information in this publication to assist in accomplishing these tasks.

Table 1.1. To prepare for computing at Los Alamos

Action	Reference	A Source for Help
Have your personal data entered into the Employee Information System.	5.2.7	**Your Group Secretary or CIC-6, 5-4444 option 2**
Determine if an ICN password or Smartcard is needed, and submit a validation form.	4.2.	**CIC-6 Password Office, 5-1805**
Define the type of workstation you need.	2.1.	**CIC-6, 5-4444 option 5 or 7-HELP**
Determine your network connection.	2.2.	**CIC-5 NOC, 7-7423**
Determine required networking software and hardware.	2.3., 2.4.	**CIC-6, 5-4444 option 5 or 7-HELP or CIC-5 NOC, 7-7423**
Obtain and install Netscape.	5.5.	**CIC-6, 5-4444 option 5 or 7-HELP**
Obtain and install E-mail.	5.2.	**CIC-6, 5-4444 option 5 or 7-HELP**
Establish "authorities" for business information.	6.2.	**CIC-6, 5-4444 option 2**

Table 1.2. Upon receiving your ICN password, you may access the Register utility to do the following:

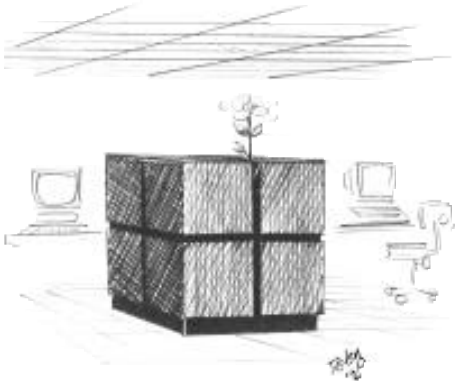
Action	Reference	A Source for Help
Register your E-Mail address.	5.2.6.	**CIC-6, 5-4444* option 1**
Register for a post office protocol (POP) server (Eudora E-Mail).	4.3.	**CIC-6, 5-4444 option 1**
Register for ICN computers (UNICOS, Cluster, etc.).	4.3.	**CIC-6, 5-4444 option 3 or 1**

* When you call the phone number for the CIC Customer Service Center (5-4444), listed throughout this document, you will then choose from a menu that will direct you to the most appropriate source to answer your question. [Section 1.5]

1.3. Overview of Los Alamos Computing Resources

The ICN is LANL's primary computer network. It provides controlled access to and support for a wide variety of computing resources. These resources generally fall into one or more categories as follows:

- Network services for access to the Internet with support for connectivity to local area networks (LANs) at LANL— permits log-in from dial-up and remote computers;
- Registration services for E-mail, compute servers, and software distribution;
- Common support services such as E-mail distribution, storage, and output routing;
- Business support services for Laboratory-wide administrative systems;
- Large-scale scientific computing; and
- General desktop computing.



This section provides a brief definition of the following resources and services:

- Clients and Servers
- Compute Servers
- Networks
- Communications
- Terminal Internet Gateway (TIG)
- Common File System (CFS)
- Adstar Distributed Storage Manager (ADSM)
- Network File Server (NFS)
- Import/Export Service (IES)
- Print and Graphics Express Station (PAGES)

Clients and Servers

Servers are computers that perform specialized services for many users or for other computers in the network. The recipient of these services (such as your workstation) is called a "client." There are a variety of servers that perform such functions as computing, security, data storage, information retrieval, E-mail, accounting, and production control.

Compute Servers

Computing/Compute Servers

Compute servers or workers execute user programs to perform numerical computations that are at the heart of most scientific, engineering, and administrative applications. A variety of compute servers employ different operating systems.

Computing/CIC Org…/ CIC-7…/Machines

- UNICOS on Cray computers in both the open and secure environments,
- UNIX (AIX, HP/UX) on Cluster Systems,
- UNIX Sun workstations and front-end processors for the Connection Machine, and
- The Labwide administration applications on machines IA and IB.

The computers are generally identified by a short name such as "rho" or "gamma." Some computers provide for specialized applications such as those on the IA and IB machines.

Networks

Computing/Compute Servers/ Cluster

The ICN uses the TCP/IP (transmission control protocol/Internet protocol) originally developed for the Department of Defense (DoD) "ARPANET," which are now the most widely used Network protocols. Most vendor and third-party software assumes the presence of TCP/IP.

Computing/CIC-5 Network Engineering

TCP/IP and the UNIX operating system provide the foundation on which CIC Division has built a distributed computing environment. Because this foundation is constructed from standard hardware and software, ICN users are able to take immediate advantage of the many tools and software applications available from all over the world. Use of these tools permits workstations, supercomputers, and specialized processors to be linked into a single, integrated computing system—the ICN.

Each ICN security environment is networked independently. There are no connections between the open and secure networks.

Communications

Communications into the ICN are handled by specialized computers in the CCF that direct, validate, and control your communications to the ICN resources in a way that is almost transparent to you. Both network connectivity (TCP/IP) and dial-up service (ISDN—Internet Services Digital Network) are provided.

Computing/CIC Org/CIC-4 Telecommunications

Terminal Internet Gateway Services (TIG)

The TIG permits dial-up (SLIP and PPP) access to Laboratory computers or to Internet hosts from asynchronous terminal emulators (VersaTerm, TN3270, etc.).

Computing/ Network Services and Resources/TIG

Common File System (CFS)

The CFS is a large central data storage and retrieval system for the worker computers and distributed processors. The CFS is used for long-term and archival storage.

Computing/ CIC Org..., Centers.../ CIC-11 Storage Systems/CFS

The Mercury system provides the ability to move unclassified data files between the secure and open CFS in a secure, controlled, and auditable way. Because of some of the ways we have had to implement security requirements, there may be several hours delay when moving data in this manner.

Computing/ Compute Resources/Mercury

Adstar Distributed Storage Manager (ADSM)

ADSM is a file storage and backup service available in the open partition. It provides automated file backup of workstations and personal computers and has an archival file storage capability for large files.

Computing/ CIC Org..., Centers.../ CIC-11 Storage Systems/ADSM

Network File Server (NFS)

The NFS is an ICN service that allows UNIX files to be located remotely and yet appear to be local to compute servers and workstations. NFS promotes distributed computing by allowing data to be computed on supercomputers and results displayed on a workstation without requiring the user to move files.

Computing/ CIC Org..., Centers.../ CIC-11 Storage Systems/NFS

Import/Export Service (IES)

IES provides a method to move electronic files into and out of the Laboratory in a secure way using popular forms of media. The IES supports 1/2-inch 3490 tapes as well as 4-mm, 8-mm, and 1/4-inch tapes at several densities. The export function copies entire CFS trees onto tapes in a "tar" format that can easily be restored to CFS or some other system at a later time. The import function provides for a binary transfer of tape files into CFS.

Computing/ Computing Resources/IES

Print and Graphics Express Station (PAGES)

PAGES provides centrally located hard copy devices such as film recorders, plotters, and high-speed laser printers for your text and graphics output.

Computing/ CIC Org..., Centers.../ CIC-17/PAGES

1.4. Computer Security

Info by Organization/ Facilities, Security, and Safeguards Division/

Computer security is something we at LANL take seriously. As a Los Alamos computer user, you are required to follow security policy that is set by the U.S. Department of Energy (DOE). Failure to follow this policy will result in removal of your computing privileges, possible discipline (administrative reprimand, security infraction, or even termination), and/or prosecution when deemed appropriate. Please know what is required of you!

The ICN is divided into two computing environments to provide flexibility in services and protection for classified and sensitive information. You must always be aware of the environment you are working in and the security level of the material you are working with.

- The open/administrative environment is used for processing unclassified and unclassified sensitive data only.
- The secure environment is used for processing secure, classified, and national security material.

All users at LANL are required to have training in computer security. The Computer Systems Security Officer (CSSO) and Organizational Computer Security Representative (OCSR) for your organization are responsible for providing your training. If you are unsure who your CSSO and OCSR are, ask your manager.

All Laboratory computers, computing systems, and their associated communication systems are to be used only for official business and must be protected in accordance with property protection and security rules. In addition, software must be legally procured, and you must maintain records of ownership, such as proof of license requirements, software documentation, or the original application disks to prove that you are the authorized owner. You must not duplicate or use copyrighted or proprietary software without proper authorization.

FILE AUDITS—Your management, OCSR, CSSO, the Facilities Safeguards and Security Division, the CIC Division, and the DOE have the authority and the responsibility to audit your files on any computing system used for Laboratory business to ensure that you abide by these rules.

UNREQUESTED OUTPUT—If you receive output from the ICN that you did not request (such as hard copy printout or a display on your workstation), contact the ICN Password Office (665-1805) during normal working hours. Between 5:00 p.m. and 8:00 a.m. (local time) and on weekends/holidays, contact the CCF supervisor (667-4584).

ICN ANOMALY DETECTION—To ensure the security of your ICN computing files and activities, the network is regularly scanned for anomalies (such as a large number of failed log-on attempts). These are investigated and, if deemed suspicious, are called to your attention.

WATCHER—Watcher is an automated tool that assists in detecting misuse of LANL computing systems by monitoring Internet traffic at the Laboratory. Watcher looks for indicators showing that government computing resources

might possibly be supporting other-than-official uses. Watcher reports are provided to the Laboratory's Internal Evaluations Office, which uses that information to help determine where to focus their investigations.

1.4.1. Responsible Use of LANL Computing Resources

LANL computing resources are for "official use only" which means any use justifiable as being related to conducting Laboratory business. Official use includes activities obviously required for one's job, such as engineering computations, scientific research, sharing technical information for review, comment and information exchange, technical collaboration as part of one's research activities, office correspondence, and administrative record keeping.

"Unacceptable use"—activities that constitute unacceptable use of Laboratory computers or network facilities include the following:

- Use of government equipment for personal gain,
- Use for political purposes (e.g., lobbying),
- Illegal or immoral activities (e.g., fraud, embezzlement, theft, pornography),
- Unauthorized entry to other computers or networks or distributing viruses,
- Misusing or forging E-mail, or tampering with the Laboratory E-mail system,
- Activities likely to result in embarrassment to the Laboratory or DOE, (e.g., reading or distributing pornography, making libelous statements),
- Any activities explicitly prohibited by LANL policy (e.g., sexual harassment, gambling), and
- Use that interferes with job performance for an unauthorized purpose (e.g., using a Lab laptop to calculate sports statistics or balance a personal checkbook).

1.4.2. Protecting Passwords and Smartcards

All ICN passwords and Smartcard personal identification numbers (PINs) must be protected, regardless of whether they are used for unclassified or classified processing. If you are an ICN user, you are responsible for the proper storage and handling of your password and/or Smartcard and PIN. By signing a receipt for your ICN password and/or Smartcard, you agree not to misuse the ICN and to be responsible for activity associated with your user number and password/Smartcard PIN.

Info by Organization/ Facilities, Security, and Safeguards Division/S&S/ Classification and Document Release

ICN passwords and Smartcard PINs for unclassified access are sensitive information (official use only) and must be handled accordingly. Passwords for classified computing are considered Secret, National Security Information, and if written down, become classified documents. They must be marked and stored according to standard Laboratory procedures for marking and handling classified data.

- DO NOT give anyone your password or Smartcard PIN or allow anyone to use them to gain access to the Laboratory's computers.
- DO NOT leave your password or Smartcard PIN where others may view them. Never tape them to your terminal!

- NEVER store your ICN password or Smartcard PIN on-line or on any computer or terminal.
- If you think your password or Smartcard PIN has been compromised, change it using the Register facility or contact the ICN Password Office immediately.

1.4.3. Responsibilities Upon Termination or Transfer

If you terminate or transfer from LANL or a contract organization and are an ICN user, there are several things you need to do.

- Destroy documentation that contains password or Smartcard PINs.
- Return Smartcards to your group office.
- Remove machine authorizations using the Register facility.
- Transfer appropriate E-mail names to another individual.
- Delete or give someone else full access to your files on CFS (Your files will not automatically go away when your account is removed from the ICN).
- Update the Employee Information (EI) System and change codes if transferring.

1.4.4. Use of Personal Computers Off-Site

Personal computers may be used for Laboratory business off-site when the following conditions are met:

1. Laboratory rules for removing and protecting government property, as applicable, must be followed. (Material Management Manual, Section 1).
2. All Laboratory-owned systems processing off-site are subject to the Laboratory's Computer Security Program's policies and procedures.
3. All non-Laboratory-owned systems processing sensitive unclassified information off-site are subject to the Laboratory's Computer Security Program's policies and procedures.
4. Stand-alone off-site systems are for processing unclassified information only.
5. Individuals processing information off-site may be held personally liable financially for its loss, damage, destruction, or unauthorized disclosure while it is in their custody (Laboratory Office Procedures Manual, Section 7-2).
6. All software on Laboratory-owned systems that are used for off-site processing shall be properly licensed and shall be virus-tested.
7. The use of privately owned software on systems that are processing off-site is permitted if the software is fully licensed and has been virus-tested.
8. Laboratory-owned systems require a software review and virus check when returned to the Laboratory.
9. All Laboratory-owned systems are subject to being called back to the Laboratory for an audit by security and/or management officials.

1.4.5. Use of Non-Laboratory Computers On-site

Info By Organization/ Facilities, Security, and Safeguards Division

Non-Laboratory-owned microcomputers/word processors (systems) may be brought on-site for Laboratory work when the following conditions are met:

1. Systems are to be used for processing unclassified information only.
2. Each system must have a properly executed "Non-Laboratory Owned Systems at LANL" form kept with it at all times.
3. Non-Laboratory-owned systems may not be connected to any other computing or telecommunication resource unless prior written approval is given by organization management and the OCSR. When a non-Laboratory system is connected to a Laboratory computing resource or telecommunication resource, it immediately becomes subject to the Laboratory Computer Security Program's policies and procedures, and a certified Addendum to the Master Computer Protection Plan must be on file with the responsible OCSR.
4. For systems that are to be on-site for 90 days or longer an approved/certified Addendum must be on file with the OCSR, and you must have read and signed the "Users Computer Security Responsibilities" form.
5. Non-Laboratory-owned systems shall not be taken into a technical security area without prior approval from DOE.
6. All software on non-Laboratory-owned systems shall be fully licensed.
7. All software and information on non-Laboratory-owned systems shall be virus-tested. Virus testing shall be performed on a continuing basis.
8. All non-Laboratory-owned systems that are brought on-site are subject to audit by security and/or management officials.

1.5. Consulting and Training Services

Computing/Consulting Support/Costumer Service Teams

The initial point of contact for any question about CIC computing services is the CIC-6 Customer Support Center—CSC (665-4444). The CSC is made up of 6 teams that represent focused areas of service within the LANL computing environment. There is no charge for these services, which (with few exceptions) are available Monday through Friday, 8:00 a.m. to 5:00 p.m. local time. Questions that cannot be answered by one of the teams will be referred to another source.

Customer Support and ICN Password Office Teams: (back) Susan Trujillo, Lourdes Martinez, (front) Diana Tuggle (team leader), Phil Villareal, and Wanda Dunlop

1. Customer Support

Most questions concerning E-mail registration, ICN validation, the Web, charge codes, and POP (post office protocol, E-mail) servers will be answered at this level.

Voice: 505-665-4444 option 1
FAX: 505-667-5304
E-mail: cichelp@lanl.gov

2. ICN Password Office

The Password Office provides ICN passwords and LANL smartcards.

Voice: 505-665-1805
FAX: 505-667-9617
E-mail: validate@lanl.gov

Computing/ Consulting Support/ Labwide Systems Consulting

Labwide Systems Consultants: (back) Lorena Salazar, Brian Martinez, (front) Mary Billen, and Vonetta Pompeo

ICN Consulting Office Team: (L to R) Dale Leschnitzer (team leader), Sara Harshman, Ted Spitzmiller, David Kratzer, and Jeff Johnson

Computing/ Consulting Support/ ICN Consulting Service

Computing/Training

Training and Coordination Team: (back) Beverly Faulkner, Vicki Brown (team leader), Lisa Gardner, (front) Tim Serna, Nikki Watson, and Leslie Linke

Information by Organization/ Human Resources Division/ Training & Development

3. Labwide Business Systems

This team provides consulting for on-line business information systems used throughout the Laboratory such as the system that tracks employee development, the system property administrators use for property accounting, or the system for requesting domestic travel. See Table 6.1 for a complete listing.

Voice: 505-665-4444 option 2
FAX: 505-665-6647
E-mail: labwide@lanl.gov

4. ICN Consulting Office

This team provides consulting services on a wide variety of topics that typically relate to scientific or engineering computing as follows:

- Programming languages (in particular FORTRAN and C),
- System libraries,
- Graphics libraries,
- Utilities,
- Command languages,
- Assistance with debugging codes,
- Use of controllers, and
- Network communications.

Voice: 505-665-4444 option 3
FAX: 505-662-5304
E-mail: consult@lanl.gov

5. Computer Training

The Training, Development, and Coordination Team, in concert with other groups and divisions, offers a wide variety of training programs to assist you in making the best use of computing resources. The team coordinates four primary areas of training:

- Communications (e.g., Eudora, Meeting Maker)
- Labwide systems (e.g., Data Warehouse, Employee Information, Travel)
- Advanced Technical Training (e.g., C++, Java, UNIX)
- Web (e.g., HTML—hypertext markup language, Netscape)

A complete list of training courses and schedule dates is available from WWW.

PC and Macintosh applications training (such as Excel, Windows, etc.) is provided by the University of New Mexico-Los Alamos.

If you are unsure of what kinds of training are available or how you might benefit from training, you are encouraged to call the CIC-6 Training Office for personal consultation.

Voice: 505-665-4444 option 4 or 667-9559
FAX: 505-667-5304
E-mail: cic6-train@lanl.gov

6. Desktop Consulting

Computing/Desktop Support

The Desktop Consulting Team is available to all LANL employees and contractors. When you call 665-4444 option 5 or 7-HELP, you can choose from the following computer support via your touch-tone key pad:

1. Macintosh assistance,
2. PC assistance, or
3. Other desktop assistance.

Voice: 505-665-4444 option 5 or 7-HELP
FAX: 505-667-5304
E-mail: desktop@lanl.gov, mac-help@lanl.gov, or pc-help@lanl.gov

Desktop Consulting Team: (L to R) John Lucero, Judy De Augero, Geary Radcliffe, Diana Tuggle (team leader), and Weldon Scoggins

CIC-2 maintains a software lending-library service. Software applications for PCs and Macs may be checked out for evaluation. Please call 665-4706 for a list of available software or visit our Web site.

External Computing

This organization provides administrative support to external users.

Voice: 505-665-4444 option 3
FAX: 505-667-5304
E-mail: external_computing@lanl.gov

External Computing Team: (L to R) Ann Dingus and Lori Kelley

Network Operations Center (NOC)

Computing/ CIC Org…/CIC-5

For network problems, you should call the NOC, 667-7423. If you are uncertain that you have a network problem, call CSC, 5-4444. The NOC manages the LANL open Internet, diagnoses and repairs LAN and data communications problems, and is the main point of contact for network customer service. The NOC maintains the host-name-to-address database domain name system (DNS) and other network information services.

The NOC is staffed with technically competent technicians that resolve problems over the phone if possible. The NOC will also dispatch field technicians if required. The NOC implements emergency corrective maintenance if multiple users are affected (trouble ticket escalation). The NOC is staffed from 7:00 a.m. to 5:00 p.m. Monday through Friday, and also provides after-hours and weekend on-call technicians support.

Voice: 505-667-7423 or after-hours dispatch 667-4585
E-mail: nst@lanl.gov
Trouble ticket logged by E-mail: noc@lanl.gov

The hostmaster adds, changes, and removes information about computers on the LANL networks kept under DNS.

Voice: 505-667-7423
E-mail: hostmaster@lanl.gov

2. DETERMINING NETWORKING REQUIREMENTS

The ICN is an important tool in accomplishing the Laboratory and DOE goal of electronically linking all employees. Full participation in research, development, and administrative activities will increasingly require the kind of electronic access the ICN and the Internet make available to Laboratory employees, associates, and contractors.

The ICN is connected to the Internet, a worldwide collection of computer networks whose users can communicate with each other using a variety of networking applications. If your workstation is a part of the ICN, you can, for example, access remote computer resources, order supplies, access airline schedules, or use the "Information Superhighway" (Internet) to perform a variety of other activities. If you need Internet or ICN access, the following questions must be addressed:

2.1. What Type of Workstation Is to be Used?

There are three primary types of personal workstations that are supported at Los Alamos: PC (and PC clone), Macintosh, and UNIX-based workstations (Sun, SGI, etc.). Call your group office or CIC-6 (7-HELP) for assistance in determining what type of workstation is best suited for your environment and applications.

2.2. What Types of Communication Links Are Available?

There are several types of communication links that may be used to connect to the ICN. Your specific work area may limit your selection. However, depending on the types of applications that are required, you may elect to have upgraded communications installed. Call CIC-5, NOC, (7-7423) for assistance in determining what communication is available. CIC-5 can also help you select an appropriate modem if you need a dial-up connection. Table 2.1. describes the primary communication links.

Table 2.1. Type of Communication Link

Link	Data Rate	Description
LAN	10 MB	Provides a direct high-speed link (TCP/IP) to the ICN/Internet [see Table 2.2]
ISDN	57.6 kB	Access the ICN/Internet via Lab phone links to the TIG. Your workstation must use an appropriate emulator [see Table 2.2]
Telephone Dial-up Link	28.8 kB	Access to the ICN/Internet via common carrier (U S West, etc.) to TIG. Your workstation must use an appropriate emulator [see Table 2.2]

2.3. What Communication Hardware/Software Is Needed?

Depending on the type of communication link chosen, your workstation may need the software identified in Table 2.2. Your local computer person or CIC-2 can assist you in selecting, installing, and configuring your network hardware and software.

Table 2.2. ICN Workstation Communication Requirements

		Communication Link		
Type of Workstation	**Type of Connection**	**ISDN 57.6 kB**	**Dial-up 28.8 kB**	**LAN 10mB**
Macintosh	Serial	VersaTerm Pro	Modem and VersaTerm Pro	N/A
Macintosh	SLIP[1]	MacSLIP or	Modem	Ethernet Connector or Card IP Address
		VersaTerm and SLIP (serial cable)	MacSLIP or VersaTerm SLIP	
	PPP[2]	MacSLIP and serial cable	Modem and MacSLIP	Ethernet Connector or Card IP Address
PC	Serial	Terminal/ Hyperterm	Modem and Terminal/Hyperterm	N/A
PC (Windows 3.1)[3]	SLIP/PPP	Trumpet or OnNet (PC/TCP) (serial cable)	WIN95/NT40 Built In Trumpet or OnNet (WIN 3.1) (PC/TCP) (serial cable)	Ethernet Card, IP Address, WIN95/NT Built In Trumpet, or OnNet
PC (Windows 95/NT)		PPP serial cable	Trumpet serial cable modem	Trumpet Ethernet Card IP Address
UNIX Platform (Sun, SGI, etc.)	TCP/IP (Ethernet)	N/A	N/A	Standard Hardware and Software Connectivity

[1] (serial line Internet interface protocol)
[2] (point-to-point protocol)
[3] Microsoft Internet protocol stack is recommended for Windows 95

Definitions for "Type of Connection"

Terminal (Serial)—A relatively slow link that employs terminal emulators to pass data one character (byte) at a time.

TCP/IP—protocol that is typically used as the primary method of communications for Ethernet LANs.

SLIP and PPP—allow ISDN and dial-up connections to work with ICN/Internet protocols. When used, they connect to the ICN through the TIG, a special entry point that allows you to perform functions (Telnet/FTP) and applications with Internet hosts.

2.4. What Are the Networking Software Requirements?

With the link established and the networking communication installed, you can use Table 2.3. to identify the software that will provide for the functions or resources noted.

Table 2.3. Workstation Networking Software Requirements

Type of Workstation	Function or Resource	Required Software
Macintosh	Telnet	National Center for Supercomputer Applications (NCSA) Telnet or VersaTerm Pro
	FTP	Fetch or VersaTerm FTP Client
	3270 Emulator	TN3270 (requires MacTCP installed)
	POP	Eudora
	PAGES	MacPPAGES or Appletalk Zone & PAGES software
	CFS	Use FTP Client to “ftp cfs.lanl.gov”
	WWW	Netscape
PC	Telnet	(Windows 95/NT) Microsoft Telnet.exe (Windows 3.1) FTP’s WTNVT (PC/TCP) or TNVT Plus
	3270 Emulator	WTN3270 or QWS 3270
	FTP	FTP
	POP	Eudora
	PAGES	PAGES software & net access to PAGES
	CFS	Use FTP Client to “ftp cfs.lanl.gov”
	WWW	Netscape
UNIX	Telnet	Telnet
	FTP	FTP
	3270 Emulator	X3270
	POP	Netscape 2.0 or higher
	PAGES	PPAGES
	CFS	Use CFS utility or FTP Client to “ftp cfs.lanl.gov”
	WWW	Netscape

2.5. What are the Resource Access Requirements?

To access the ICN computers and resources, you will need to have a variety of requirements fulfilled as noted in Table 2.4. Call the CSC (5-4444, option 1) for assistance in determining what requirements you need to access specific resources.

Table 2.4. Resource Access Requirements

Application Resource	Access Limited By[1]	Authentication (Kerberos)[2]	Password[3] Required
IA or IB	Authorities	yes	ICN password from admin environment
IA (Labwide)	Authorities	yes	passcode from open environment
IB (Labwide)	Authorities	yes	ICN password and Smartcard (accessed via IA) passcode if accessed directly via TN 3270
IA (Web)	Authorities	yes	passcode
IB (Web)	Authorities	yes	passcode and password (accessed via IA)
Register	Entry in EI[4]	yes	ICN password or Smartcard
UNICOS[5]/UNIX	Registration	yes if Klogin fm wkstn	ICN password or Smartcard
Cluster	Registration	yes if Klogin fm wkstn	ICN password or Smartcard
POP	Registration	yes	POP password
PAGES	Valid charge code	yes from workstation	no
CFS	Valid charge code	yes from workstation	must have Kerberos ticket first
Client-Server (Labwide)	Authorities	yes	passcode from open environment
Web-based (Labwide)	Authorities	yes	passcode from open environment

[1] A definition of each access limitation is in Table 2.5.
[2] A description of Kerberos Authentication is found in Section 4.4.
[3] A definition of each type of password is in Table 2.6.
[4] Employee Information (see Table 6.1)
[5] UNIX-based Cray Operating System

Table 2.5. Description of Access Limitations

Access Limitation	Description
Authorities	The Laboratory-wide business applications permit each employee to view only selected portions of business files. Greater access can be provided by your group leader or the Labwide Consulting Office.
EI	You must have an entry for yourself to register for ICN resources or use the EWP.
Registration	Allows each employee to validate himself/herself on the various ICN resources.
Charge codes	The cost center and program codes to which your computing use is charged. Your group secretary should provide this information.

Note: A definition of each type of password is found in Table 2.6.

Table 2.6. Types of Passwords

Access Limitation	Description
ICN Password	An eight-character string (issued by the ICN password-generation program or the Password Office) that permits access to ICN resources. There are different passwords for each level of computing (open, secure/classified). Must be changed every six months.
Passcode	A six-digit number derived from a Smartcard that permits access to the administrative partition from workstations in the open environment. Also can be used for access to the open partition.
POP Password	An eight character (user selectable) password selected at the time of POP registration. This is not considered a secure password; therefore, the ICN password must never be used for this.
Secondary Password	A six-to-eight character (user selectable) password for multiuser workstations (UNIX).

2.6. Connecting to LANL from Home or Travel

If you are at home or on travel, there are a variety of ways to connect to the ICN, but to take full advantage of ICN services, the minimum connection should be SLIP or PPP over a telephone line. This will assure you of access to LANL-only services because you will effectively have a LANL Internet Protocol (IP) address. To connect to the ICN with SLIP or PPP you will need the following:

- Laptop or home computer with at least a 9600 baud modem [see Sections 2.1 and 2.2],
- Telephone line,
- ICN phone numbers [Section 5.1.4],
- ICN password or Smartcard (if you need access to the Admin partition) [Section 4.1],
- Install TCP applications software (may come with SLIP, PPP),
- Install SLIP or PPP software [Section 2.3],
- Configure network information for the ICN [Section 4.3], and
- Establish a POP account (to use a POP mail tool like Eudora) [Section 5.2.].

Computing/ Compute Resources/ Charge Rates

The following will help you estimate the cost (1997 rates) to connect to the ICN with SLIP or PPP (see Section 4.5 for more information about charges):

- ICN password ($7.00/month)
- Local dial-up ($0.015/minute)
- FTS800 dial-up ($0.105/minute)
- ICN POP account ($15/month). Some groups maintain their own POP service.
- Software (varies)—commercial software, shareware, and freeware are available.
- Modem ($150–$400)
- Installation and configuration (varies)—call CIC-2 7-HELP or your group's computer support staff.
- Smartcard ($125)—good for three years.

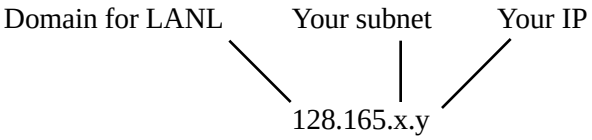
2.7 Network Information to Configure for the ICN

When configuring your PC or Mac for network and E-mail access, the following information shown in Table 2.7. will typically be needed.

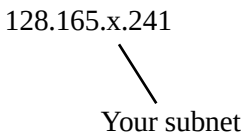
Table 2.7 Network IP Addresses

Server	Name	IP Address
Domain name servers	(use IP address)	128.165.4.4 192.16.1.2
Mail Forwarding	mailhost.lanl.gov	(use name)
Network News (news)	newshost.lanl.gov	(use name)
Time and Date (Network Transport Protocol)	timehost.lanl.gov	(use name)

LANL IP addresses are configured as follows:



Standard gateway is configured as follows:



2.8. Networking Functions

There are several basic networking functions that permit you to use computing and network resources in remote locations.

- Remote log-ons (Telnet and KLOGIN) permit you to work through your local workstation (lhost) to a remote host (rhost). Using a workstation windowing environment, you can be logged in to several hosts simultaneously and move between the windows as tasks demand. Refer to the log-in section for information about the log-in process [Section 5.1].
- File transfer operations (FTP, CFS, NFS, ASDM, Fetch) allow you to move files between a remote host or file server and your workstation. Refer to the file transfer section for information about these functions [Section 5.4].

While these networking functions are usually performed explicitly, they may be embedded in applications and appear transparent. Some of these functions may not be available unless the appropriate software has been installed on your workstation. Additional network applications include E-mail and the WWW; both are covered in other sections of this document.

3. DESKTOP HARDWARE AND SOFTWARE

3.1. Desktop Support

The Desktop Group (CIC-2) provides software installation and networking support of Laboratory desktop systems, applying emerging desktop technology to solve critical Laboratory needs. The CIC-2 phone number is 667-5355.

Several Web pages of particular interest to desktop users are as follows:

- ESD (electronic software distribution) allows LANL-affiliated individuals to purchase, register, verify licensing, and download volume-procured and site-licensed commercial and shareware software using the Web.
- News links to just-in-time (JIT) vendors and important desktop computing sites including large companies, vendor directories, and other hardware and software resellers.
- CIC-2 Technical Support maintains a Web page that provides links to a variety of desktop support resources.

Computing/ Software Distribution/ Electronic Software Distribution

Computing/ CIC-2 Desktop Support/News

Computing/ Desktop Support/ Technical Support

To help you select the most appropriate computing environment, you should make a list of the types of uses you may have (word processing, graphics packages, programming, etc.), your network environment, and the performance expectations. CIC-2 can provide technical assistance to set up and install software and/or hardware with technicians who come to your work area.

Computing/ CIC Org…/ CIC-2 Desktop support

To obtain computer hardware, contact your group secretary or other person within your organization who is authorized to purchase computer equipment. If you need help determining your specific hardware requirements, contact your local system administrator. For hardware repair services, contact the CSC at 665-4444 option 5 (or call 7-HELP).

3.2. Desktop Software Standards

The Information Architecture (IA) team at LANL has determined a set of software for use on all LANL computers. These standards include software for Communications: E-mail client, Internet browser, terminal emulation, file transfer; electronic documents; operating system; protection: virus detection, password/screen lock; utilities: diagnostic, file decompression; basic business applications suite: word processor, spreadsheet, presentation graphics; calendar/scheduling; groupware; and on-line forms.

Information by Subject/ swapshop

Information by Subject/ Information Architecture Project/Clickable Guidance Summaries

3.3. Software Distribution at LANL

CIC makes most of the IA standard software available through the ESD Web site. Software can be licensed and downloaded at this site and is the preferred method to get IA standard software.

Information by Subject/ Electronic Software Distribution

Other software can be purchased through existing JIT purchasing agreements via the on-line “Stores” system. Finally, software can be accessed from various LANL and public software archives such as the /user/lanl NFS server (kufssa).

3.3.1. Electronic Software Distribution (ESD) Web Site

The ESD Web site http://www-cic2.lanl.gov/esd/ can be accessed with Netscape Navigator or the equivalent. Use this site to register and download most (soon to be all) of the IA standard set of software, as well as a few other useful programs. If you need help with the ESD, send E-mail to esdmaster@lanl.gov.

3.3.2. Just-in-Time (JIT) Software Purchasing

LANL has a JIT software contract for purchasing PC and Macintosh software. There are various ways of ordering software through JIT. The on-line "Stores" system is available through the IA machine (for help with the on-line ordering system, call 7-9444). To order by phone, call BUS-4 (7-8673 or 7-4171) or call C. J. Enterprises directly (672-9435).

http://www.cje.com

Information about the software packages themselves is available on the Web.

3.4. Downloading/Configuring Network Software

This section shows how to get workstation networking software and identifies the critical configuration information.

3.4.1. OnNet/Transmission Control Protocol (TCP) Network Software for PCs

The Laboratory has a site license for OnNet/TCP Network Software, which is available from the ESD. During the installation, use the license number 0050-10M07-0065. No serial number is necessary. If you need help installing the software, contact CIC-6 at 7-HELP.

3.4.2. Windows 95 Serial Line Internet Interface Protocol (SLIP) Installation

Computing/Desktop Software/Tech Support/LANL Links/SLIP to TIG in Win 95

If you already have a modem installed and configured, and you are not connected to any network (i.e., through a docking bay), you can install SLIP by following the instructions in Appendix 1.

If you have the floppy disk version of Windows 95, you may not have all the files you need. See the Microsoft dial-up scripting support page on the Web.

3.4.3. Macintosh Networking Software

For instructions on how to install and Configure SLIP software see Appendix 2.

3.4.4. TN 3270 Emulator for the Macintosh

TN 3270, a freeware program that emulates an IBM 3270 terminal, is useful for accessing Labwide applications. An icon is available through ESD to connect directly to the IB system.

TN 3270 will run on any Macintosh with at least 500k of available random access memory (RAM) and 700k of available disk space. The Macintosh must have MacTCP installed and be connected to the Laboratory network via Micom, ISDN, SLIP, or Ethernet (LAN). Obtain TN 3270 from the Web.

Computing / Desktop Support/ SLIP…

3.4.5. QWS 3270 Emulator for PCs

The QWS 3270 Emulator is available for Windows 3.1, Windows 95, and Windows NT.

4. COMPUTING IN THE ICN ENVIRONMENT

While many users will have only a casual and mostly transparent relationship with the ICN, some aspects of the ICN are important for most Los Alamos computer users to understand.

4.1. Becoming an ICN User—Validation

Because the LANL network is accessible from the Internet, there is a need to protect it from unauthorized use and abuse. Among the several layers of protection is the use of "passwords" at the user level. By requiring the use of a password, the system can limit access and privilege to different environments and resources of the ICN.

The most common password is the "ICN password" that allows access to the computing and network resources controlled by CIC Division. Access to administrative data that may contain sensitive personnel or business operating data is protected by the use of ICN passwords and Smartcards. Personal computers, E-mail accounts, and storage systems may make use of a secondary password.

Computing/ICN Validation and Registration/Register for ICN Accounts

ICN passwords provide the most security, with different passwords for both the Open and Secure computing environments (so you could have two). Additional information on the generation and security of passwords is contained in the section on security [Section 1.4]. The FY 1997 rate is $7 per month for an open or secure classified password.

4.2. Requesting a Password

Computing/ICN Validation and Reg/Validation…

To request a password and/or Smartcard to access the ICN, complete and submit an ICN Validation Request form to the ICN Password Office. This form is available from the following sources.

- The Web version is a PDF (portable document format) file and requires Acrobat Exchange to view or print. Acrobat Exchange is available through ESD.
- The JetForms utility.
- The monthly CIC publication *BITS* (see the back of this issue).
- Group offices.
- Call the ICN Password Office (665-1805) to have a copy faxed or mailed.

The following requirements must be met before your Validation Request can be processed:

- All Validation Requests must be approved by your manager, who signs the "Authorization" area (on the back).
- Access to the secure environment of the ICN requires a DOE Q-clearance or a DoD Secret (full background) clearance with Restricted Data certification and a second management approval (on the front of the form).

- Non-LANL employees are required to have a LANL contact. Your contact person must also sign the "Authorization" area.
- Non-US citizens (visitors or assignees) must attach a copy of Form 982 (Request for Unclassified Visit or Assignment by a Foreign National) with all approval signatures. Be sure Box #11 of Form 982 is completed. If you are not covered under a LANL/DOE-approved Visitor Assignment Request, attach written justification from your host group leader describing your need to access the ICN.
- If you require administrative access (Labwide systems such as Time & Effort, Stores, Travel, and Data Warehouse) and are not a cleared, full-time LANL employee, contact the Labwide Systems Office (665-4444, option 2) and request an access authorization packet, which contains additional forms. You must also attend a Labwide systems access security briefing. Administrative users under 18 years of age should contact Labwide systems office (665-4444, option 2).

New ICN accounts are created immediately upon receipt of your Validation Request. For faster service, FAX or hand carry the request to the Password Office (TA-3, SM-200, Room 257). You must have either a Q or an L clearance to enter this area.

When you receive a password or Smartcard, sign the password/Smartcard receipt and return it to the Password Office via inter-office mail (MS B251) or fax (667-9617). Your password and/or Smartcard will be activated when the Password Office receives the receipt.

Please read all information included in your password packet to be informed on security issues and your responsibilities as an ICN user. There is also information on how to use "Register" for machine validations, E-mail addresses, charge code information, and resetting Smartcard PINs.

Computing / ICN Validation…
/ ICN Password Office…
/ Smartcard Quick Guides

4.2.1. Use of Smartcards

You will need a Smartcard to access business systems applications. You must have an ICN password to use a Smartcard.

A Smartcard is a credit-card-sized computer that generates passwords, or in Smartcard parlance, "passcodes." Like a desktop computer, it has a keyboard (the set of keys at the bottom of the card), a screen (the small display window at the top), and a microprocessor, which makes it a "Smartcard."

When you receive a Smartcard, it will have a PIN preselected and registered. Each time you key this PIN into your Smartcard it generates a new, unpredictable passcode that is valid for one log-in ONLY. The ICN authenticates the passcode based on your Smartcard serial number, your PIN, and the time. The small bars to the left of the passcode indicate the time remaining (in ten-second intervals) for the use of each passcode.

The capture of passwords, either as they travel through the network or reside in a system file, is an overriding concern in computer security. With the Internet, this risk has grown enormously. The best defense to this threat is a one-time, disposable password—no more password file to "hack" and no more permanent password to "sniff."

Computing / ICN Validation and Registration / ICN Password Office / Smartcard Quick Guides

Smartcard quick reference cards for both Macs and PCs are available from the ICN Password Office (665-1805) or on the Web.

4.2.2. ICN Password Renewals

ICN passwords in the open and secure environments must be changed semiannually. You can change your own password for open/administrative computing via on-line renewal—either when the password comes up for renewal or at any time beforehand (if you're concerned your password may have been compromised or "sniffed"). The Password Office will notify you by E-mail one month before your password expires.

To change your password,

- Log on to the Register machine [see Section 4.3.],
- Select "Change your ICN password," and follow the prompts.
- Fifteen passwords will be displayed. Decide on the one you want, and enter it at the prompt. When you select a password, it goes into effect immediately, and your expiration date is moved forward six months.

Secure/Classified passwords are changed every six months. Thirty days before a LANL user's password is due to expire, the Password Office sends that user a memo indicating that it is time for renewal. If the user has an encrypted line, the password can be changed on-line by accessing the secure "Register" machine (instructions on how to do this are included in the renewal notice). If the user does not not have an encrypted line, he/she must go to the Password Office to pick up and sign for a new password. Renewals for non-LANL users are mailed to their classified mail channels. These mailings indicate the new password and include a receipt that must be signed and returned to the Password Office before the new password is activated.

Users have thirty days to change their passwords. Reminder notices are sent to LANL users at ten-day intervals until the password is changed. If the password is not changed within the thirty-day time frame, the account is closed. To reactivate the account the user must complete a new ICN Validation request and submit it to the Password Office.

4.2.3. Non-LANL Users

LANL also allows non-LANL people to use the ICN. Computing services are generally available, for a fee, to other government agencies. Otherwise, you must be in collaboration with LANL employees.

If you are not a LANL employee, and you want more information about obtaining an ICN account, call the External Computing Office at (505) 665-1517 or send E-mail to external_computing@lanl.gov.

4.3. Registering for ICN Resources

To use specific ICN resources such as E-mail or compute servers, you must be a "registered" user. A server called "Register" provides a centralized

registration function. After receiving your password or Smartcard, you can use the "register" function to do the following:

- Register, display, or remove authorization entries for various ICN compute servers,
- Register for ICN E-mail POP service,
- Change your ICN password or resynchronize your Smartcard, or
- Establish E-mail addresses. [see Section 5.2.6].

There are several methods that may be used to log on to the Register machine; all but one require the ability to perform a Telnet function. If your workstation has Telnet, proceed as follows:

- From Netscape "LANL home page" choose Computing/ICN Validation and Registration/Register for ICN Resources.
- From UNIX, type the command "telnet register.lanl.gov."
- From Macintosh, using NSCA Telnet, open a new connection, type "register.lanl.gov" in the Host/Session name field, and click "OK." You will then be prompted to log in.
- From Windows 95/NT, select "Start" and "Run"; then enter "telnet"; select "Connect Remote System"; enter "hostname"; and then select "Connect."
- From Windows 3.1 (need PC/TCP) click on "TNVT" (under the group "PCTCP Win Apps"), select "new," and type "register."
- If you have the ability to log in to machine IA, from the IA menu select "AC."

When you log in to "register" you will see the following menu:

```
Unauthorized access prohibited register.lanl.gov
Enter your 6-digit ICN User Number or a registered name:
      ['?' for help, RETURN to exit]: 012345
Registration for '012345'

      1. Go to Name Registration
      2. Change ICN password
      3. Set Smartcard's PIN
      4. Resynchronize Smartcard
Enter option [return to exit]
```

Option 1 is used to perform most of the functions. The following example shows how the registration menu will appear:

```
    Name Registration for Primary Name `xxxx'
 -------------------------------------------------

  1.  View ICN Computing Registration Information
  2.  Register for ICN Computing Resources
  3.  Set Default Charge Code
  4.  Set E-Mail Forwarding Address
  5.  Set URL WWW Homepage
  6.  Create a New Secondary Name
```

```
        7.  Edit an Existing Secondary Name
        8.  Delete `xxxx'
        9.  Give `xxxx' to Another User

Enter option [RETURN to exit]:
```

Select option 1 to view your computing environment:

```
Enter option (RETURN to exit): 1

        Primary Name : abc       Owner : 012345
        UID: 1059
        E-mail Forwarding Address: abc@ahost.lanl.gov
        Default Charge Code: 8h0600x33p00000000

        `abc' Secondary Names :
        u0123435
        big_deal

         System(s) registered on:
        IBM-CLUSTER
        OPEN-CRAYS
        POP (beasley/pobox1663)

         Mailing lists `abc' subscribed to :
         project_j (joe doe, doe@lanl.gov, 505 667-1234)
```

4.3.1. Registered Computer Names

In the new register system you may have many names associated with your Z-number. You may define an E-mail forwarding address and World Wide Web (WWW) URL for each name. Some names have additional properties or restrictions:

- **primary name**—The lanl.gov E-mail name is the name that will appear in your LANL phone book listing.
- **secondary name**—All your "other" names (aliases) inherit the primary name forwarding address if a forwarding address is not explicitly defined; E-mail to these names will work but will not show up in the phone book listing.
- **moniker/unix-username**—The name that is associated with the UID (UNIX user identifier) number; UNIX accounts such as the Cluster and Cray accounts will be created under this name, which must be 8 characters or less. Only one name may have a UID.

4.3.2. First-Time ICN Users

If you are registering for Cluster or Cray accounts and are a new user, follow the instructions below:

1. Decide on a name to use for BOTH the lanl.gov address (primary name) and the UNIX accounts (UNIX username or moniker). Names must be 8 characters or less. Enter the name when prompted. You can choose from

the list provided or make one up as long as it is 8 characters or less and is not already in use by someone else.

2. Register for ICN accounts.
3. Set the forwarding address for the primary name.

Side effects: The chosen name will be the name that appears in the finger @lanl.gov database as well as the name under which your ICN UNIX accounts are created.

How to Use Register for an ICN account (Cluster (AIX), Cray (UNICOS), POP mail, etc.)

1. Choose the "Register for ICN Computing Resources" option on the Name Registration menu.
2. Select the option for the account you desire, respond to prompts, and exit the register utility.

Side effects: Your account name on the Cluster (AIX) or Crays (UNICOS) will be the name Register specifies at the time of registration. Your POP mail account will always be "u" followed by your Z-number (e.g., u012345).

How to use Register to create a new primary name

1. Select "View ICN Computing Registration Information" to verify that the new name doesn't already exist as a secondary name. If it exists, go directly to step 3. Remember the name must be 8 characters or less.
2. If the name is not already a secondary name, choose the option to Create a New Secondary Name and enter the new name (8 characters or less).
3. Choose the "Edit an Existing Secondary Name" option and select the name that you want as the primary name.
4. Choose the option "Make [xxxxx] your Primary Name."
5. Choose the option "Set E-Mail Forwarding Address" and enter the forwarding address for the new primary name.
6. Select "View ICN Computing Registration Information" to verify change.

Side effects: The new primary name is now the name that will appear in the finger @lanl.gov database; the old primary name becomes a secondary name; your UID is not necessarily associated with your new primary name; the default charge code that was associated with the old primary name will be inherited by the new primary name.

4.4. ICN Authentication—KERBEROS

To use some ICN resources such as the supercomputing facilities or the CFS, you must identify yourself with your Los Alamos User Number and ICN password. This process uses the Kerberos authentication facility in which the ICN password is never passed over the network in clear text.

Kerberos verifies your identity when you try to access different ICN resources. It does so through the use of tickets. The ticket allows you to perform many functions such as logging on, executing shell commands, copying files, and retrieving files. These actions can all be performed on remote hosts without the need to send the ICN password across the network.

Kerberos commands mimic most UNIX commands except that they start with a "k." For example, you can “klogin,” “kcp,” “krsh,” etc. You must first request a Kerberos ticket before using any of these features by issuing the “kinit” command. The “klist” and “kdestory” commands will list and destroy all Kerberos tickets respectfully. (Note that "cluster" resources use the command “k4init”).

Use of Kerberos involves several important points:

- Kerberos tickets expire after ten hours and may need to be renewed. Existing connections are not affected when tickets expire.
- Kerberos authentication is global, affecting all current and future sessions. If you authenticate yourself in one window, the authentication may affect all windows. If in doubt, you can always use the “klist” command to verify the active Kerberos authentication.
- The k-commands are used to connect your workstation to ICN resources (such as UNICOS). They do not work from UNICOS to your workstation or between local workstations.

Once you access a resource (such as UNICOS) with a Kerberos command such as “klogin” and you are "authenticated," there is no functional difference between that command and the standard UNIX r-command. The k-commands transparently authenticate and are considerably more secure than standard r-commands.

4.5. Charging Policy for ICN Use

Some CIC organizations charge for their services. These services include the following:

- UNICOS and Cluster CPU (central processing unit) time, input/output (I/O) and memory use (dependent on the specific system used);
- ICN dial-up communications (including 800 service);
- CFS service charges (dependent on file storage activity and output device); and
- PAGES charges (dependent on output activity and output device).

The rates are listed on the Web.

Computing/Compute Resources /Charge Rates

Most ICN resource charges you accumulate are assigned to the default code defined in the Register facility. This default code contains the first four characters of the cost center (followed by two zeros) and the first four characters of the program code. Example: 8j0900W123. The cost center usually relates to your group, while the program code is the specific project worked on. A few compute services that use the ACS are described in Section 7.

Computing/Network/ Network Recharge

Your ICN charges for a given period can be displayed by accessing the Web.

Changing Charge Codes

The primary means of changing a charge code is through the Register facility. From the main menu:

- select Option 1, E-mail and CIC service registration;
- then select Option 2, user information; and
- then select Option 2, default charges code.

http://nocone:8000/~bill/cgi-bin/charges.cgi

This will affect the billing for UNICOS, the Cluster, CIC POP servers, and ICN passwords and Smartcards. However, it will not affect other resources that are changed individually. Information on how to change various charge codes is available on the Web.

Computing At LANL/Welcome…/Changing Charge Codes

5. COMMON COMPUTING RESOURCES AND SERVICES

5.1. Logging-in to Remote Computers

Remote log-ins allow you to log in to another computer from your lhost, executing programs and accessing services as though you were sitting at that rhost. (Networked computers are often referred to as “hosts” in much of the supporting documentation). The log-on process may differ depending on the type of workstation being used and the method of connection. The following is a description of some of the log-on methods currently available: TCP/IP connections using Telnet, “rlogin” or “klogin,” and dial-up /ISDN type connections using terminal emulators (such as VersaTerm).

5.1.1. Telnet Log-on

Use Telnet to log on directly to TCP/IP hosts such as UNICOS machine Rho:

```
telnet [rhost]
```

where rhost is the remote host name. [Refer to Section 4.3 to see how Telnet works with different types of workstations.] The following is a sample log-in session.

```
% telnet rho
Trying 128.165.220.1...
Connected to rho.lanl.gov.
Escape character is '^]'.

Cray UNICOS (rho) (ttyp007)

login: abc
ICN Password or Passcode [012345]: (echo suppressed)
Last successful login was : Wed Feb. 28 12:46:47
from abc.lanl.gov
followed by 1 failed attempts
LANL ACCOUNT = 7c04wr43
Logon Compartment = NULL

rho%
```

If the Telnet command is used without arguments (or fails to make the desired connection), it enters the command mode, shown by the prompt TELNET>. Enter QUIT or <CTRL-c> to exit Telnet.

5.1.2. Terminal Internet Gateway (TIG)

The TIG permits access to Internet hosts from terminals via the following:

- Dial-up (505) 667-9020/9024 or (800) 443-1461
- ISDN

To log in via dial-up, select an appropriate number and respond to the prompts.

At the "tig>" prompt, you can make connections to a host by simply entering the name of the host or by entering commands to the TIG. When finished using the TIG, log off the host, then log off the TIG with "EXIT." The TIG also terminates any connection after 30 minutes of inactivity.

5.1.3. Remote Log-in—Klogin

"Klogin" uses Kerberos tickets obtained with a "kinit" command which is used on most servers. Therefore, when you use "klogin," there is no request for a password.

5.1.4. Dial-Up into ICN Using SLIP and PPP

SLIP and PPP allow you to sign onto the ICN from a telephone line (with a modem) and proceed as if you were on LAN connection. You can then send files via FTP, connect via Telnet to a variety of remote hosts, and use client/server applications such as Eudora. Before attempting to use SLIP or PPP, you must configure it properly. Call CIC-6 (7-HELP) for assistance.

To use SLIP, you need a telephone line, a Mac or PC with a modem (1200 to 28800 baud rate), and the appropriate software (see Table 2.2).

5.1.5. How to Use SLIP From a Mac

To use SLIP from a Mac, proceed as follows:

1. Run MacSLIP or MacPPP.
2. Click "Connect."
3. Enter your ICN user number and password when prompted.
4. Everything is automated. Do not type in the "Status" box. This box shows you what is automatically happening, such as getting your IP address.
5. To disconnect, click "Disconnect" in the VersaTerm AdminSLIP application.

To check to see if the SLIP connection is active to the ICN, select "control panel" and look at "VersaTerm controlSLIP" for the following message by the "Status:" prompt:

```
SLIP is active and connected.
```

5.1.6. Blacklisting Messages

During the log-on process, if you enter your password incorrectly and press <RETURN>, your log-on will not be accepted, and you will see the following message:

```
"Access denied" or "login incorrect"
```

If this occurs ten successive times within 5 minutes, or if you "successfully" log in 10 times within 5 minutes, your user number is blacklisted by the ICN. A successful log-on resets the invalid password counter to zero.

If you attempt to log on after seeing the above message, the log-on will be rejected by the ICN, and you will see the following message:

```
"Permission Denied"
```

If you think you have become blacklisted, call the ICN Password Office at (505) 665-1805.

5.1.7. Breaking a Hung Log-in Session

It is often difficult to know just when or why your computer screen might freeze. Is it the application? The host computer? The network? Your own desktop? Sometimes the cause is one of these, but often it's a combination. Whatever the problem, it has brought your ability to use your computer to a frustrating halt. Often your main concern isn't determining what went wrong; rather, you want to know how to get out of your current unproductive predicament.

Computing/Network Resources/ Breaking Network Connections

If the appropriate break sequences don't revive your computer/terminal, you may need to reboot your system or kill the window that's locked. Machinery that freezes often and consistently probably needs troubleshooting. Ask your local system administrator for help in determining the cause, or call the CSC (5-4444, option 1).

5.2. Electronic Mail (E-mail)

5.2.1. Concepts and Etiquette

Use E-mail to exchange information with other users over networks such as the Internet (open partition only). Although E-mail appears instantaneous,

- messages may not be immediately posted to a recipient,
- the recipient may not be logged on to the system, or
- the recipient may be busy with other tasks.

To use the E-mail system effectively, choose your words carefully, and

- Log on at least once each day and read your mail,
- Compose single-subject messages whenever possible,
- Define an appropriate "subject" line (avoid using "FYI"!),
- Assume that any message you send will live on indefinitely,
- Know who your intended audience is and establish an appropriate level of formality,
- Keep the list of recipients and "CCs" to a minimum,
- Identify yourself and your affiliations clearly, and
- Know when NOT to use E-mail; consider face-to-face, phone, or paper.

Most E-mail systems communicate using character sets (a text-only character format). If you must send binary data or formatted data (such as Microsoft Word), encode the message with Mime before sending it. Some mail readers cannot process these types of files. Avoid sending anything but ASCII files unless you know that your recipient can handle them.

Insert carriage returns every 60 characters or so. Don't depend on your terminal hardware carriage return to generate new lines—it probably doesn't.

5.2.2. Functionality

The following functions are available in most E-mail systems:

- Receive and read mail;
- Create and reply to mail;
- Save, delete, or hold incoming mail;
- Establish distribution lists;
- Forward E-mail to others;
- Assume an alias (log in as a guest) to another account;
- Provide travel/vacation advisement; and
- Find E-mail addresses.

5.2.3. Forwarding E-mail

All supported mail services allow mail to be forwarded to another address. You may have several systems on which you can receive mail but one that you prefer to read and log your mail. You can establish a forwarding flag on each of the systems on which you do not want to read mail.

Computing/Electronic Mail/ Introduction to E-mail/ Forwarding E-mail

5.2.4. Sending Attachments—Document Conversion

E-mail attachments allow people to easily share formatted files such as graphics, spreadsheets, and documents across different platforms and across the globe more easily than ever before. However, there are problems associated with such transfers.

E-mail travels in ASCII format. When you need to send a formatted document, such as Word, it must be encoded. Mime is the primary encoding scheme and should be used in all cases.

When you attach a file to an E-mail message, the Mime encoding scheme in your mail program converts the file to ASCII format. When your E-mail arrives at its destination, the mail package on the other end converts your attachment back into the original format.

A complete description of what facilities are available for sending attachments is on the Web along with suggested notes of etiquette.

Computing/Electronic Mail/ Introduction to E-mail/ E-mail Document Conversion

5.2.5. Choosing an E-mail Service

Eudora and UNIX E-mail services are supported at Los Alamos. The choice usually depends on the type of workstation you use, the network connectivity available, and the E-mail interaction you have with your working group.

CIC offers an Internet account that includes E-mail. You may use the Eudora POP client from your workstation or log in to the server directly using telnet (see Section 5.1).

When using POP, your E-mail is stored on the POP server until you call for it. You need a TCP/IP connection (LAN or SLIP) to use the Eudora client.

For many users the choice is simply one of personal preference. All of the supported systems can E-mail to each other and to Internet addresses outside the Lab. The following descriptions may help you decide which is best for you.

5.2.5.1 UNIX Simple Mail Transfer Protocol (SMTP)

Virtually all UNIX-based systems will have a mail facility that uses the command implementation "mail" (a primitive interface). While this is not particularly user-friendly, other mail interfaces are usually available as follows:

- Workstations such as the Sun have a mail tool facility that allows the use of a mouse for point-and-click operations. Coupled with a good screen editor such as Textedit, this is a very powerful and easy-to-use mail system.
- "Pine" is a menu-based interface and is a definite improvement over using the standard UNIX mail. It is also useful if you have a POP account but occasionally use dial-up access without SLIP.

5.2.5.2. Eudora (POP Mail Service)

Eudora is a Mac or PC windows mail application that employs icons and point-and-click operations. It communicates with an SMTP (UNIX) server to download your mail from a POP server to your Eudora client. Both LAN and dial-up connections (using SLIP) may be used to connect to the POP server where your mail is stored until you call for it. A local Eudora password is used that can be changed by you. A complete set of instructions for using Eudora is on the Web.

Computing/ Electronic Mail/ Eudora User Guide

Considered easy to use, there are several different POP servers that provide varying levels of features:

- ICN Internet user accounts (such as "POBOX1663") provide POP service. You can log on to the POP server directly using Telnet to access your mail account with a utility called "Pine" and to use FTP and CFS for file manipulation.
- Local POP servers may be established by LANL organizations with similar capabilities.

To use Eudora you must install the Eudora client software for your Mac or PC. It is available from ESD or can be purchased from the JIT vendor. The software must be configured to communicate to a selected POP server (or servers).

ICN POP accounts are available through the Register facility or by calling the CSC (5-4444, option 1).

The commercial versions of Eudora have a number of added features not found on the freeware version, and they come with a manual and free technical support from the vendor, Qualcomm. (The freeware version of Eudora is not recommended.)

POP servers use a special password (not your ICN password) that is defined at the time your account is established. It can be changed from the Register machine or from within Eudora itself.

Vacation Message

Because E-mail can be a critical part of our daily business, when you leave for vacation or travel it is important to let others know that you are not reading your mail. A vacation program is available. Connect via Telnet to the POP server and enter the command "vacation." A series of prompts will move you through the program. When you return from travel, log on and again enter "vacation."

"Vacation" will reply only to messages addressed directly to you—and then only if it hasn't previously replied to the sender during the previous week or so.

Using Pine on the POP Server

When you don't have access to a workstation that has Eudora, or you can't make an appropriate network connection (SLIP), you can still read your mail if you can access the TIG and then connect via Telnet or "klogin" to the POP server.

Example: `tig> telnet pobox1663`

Log in to the server using your ICN User Number and ICN Password. At the machine prompt (a % sign) enter the following command to identify the type of emulator you are using (typically a vt220):

```
setenv TERM vt220
```

Next, enter the command "pine." You will be presented with a series of menus that will permit you to access virtually all of the mail functions.

Configuring Eudora

To use Eudora, you must be sure that it is properly configured (see Table 5.1).

Table 5.1. How to Configure Eudora

PC Eudora (version 2.0 and above)	• Select "Tools" from the menu bar. • Select "Options." • From the "Getting Started" category, enter your POP Account address such as u01234@pobox1663.lanl.gov. • From the "Personal Information" category, enter your "Return Address" such as joe@lanl.gov. • Set the "Checking Mail" category to 15 minutes. • Set ph to ph.lanl.gov • Set Finger to finger.lanl.gov • Leave "SMTP server" blank
Mac Eudora	• Select "Special" from the Menu bar. • Select "Settings." • From the "Getting Started"category, enter your POP Account address such as u01234@pobox1663.lanl.gov. • From the "Personal Information" category, enter your "Return Address" such as joe@lanl.gov. • Set the "Checking Mail" category to 15 minutes. • Set ph to ph.lanl.gov • Set Finger to finger.lanl.gov • Leave "SMTP server" blank

5.2.6. Electronic White Pages (EWP)

Computing/Electronic Mail/Electronic Mail Registry

The EWP system (formerly EMR) is available to all Laboratory employees, contractors, and affiliates at no charge. EWP allows you to register an E-mail address in the form "user@lanl.gov." Thus, others can send E-mail to you (@lanl.gov) without having to know specifically where you receive mail. For example: fred@lanl.gov may actually be flintstone_frederick@bedrock.lanl.gov. If your actual mail address changes, you need change only the registration—there is no need to notify others of such changes.

When you are registered in the EWP, others can use the Web, Finger, or Ph utilities to find your E-mail address.

Regardless of which E-mail service you use, register your address in the EWP. First log on to the Register server [see Section 4.3] and select option 1 (type 1 after "Enter Option [exit]:") from the menu as shown below:

```
Registration for 012345
   1. Go to Name registration
   2. Change your ICN password
   3. Set Smartcard's PIN
   4. Resynchronize Smartcard
Enter option [exit]:
```

You will be asked for your ICN password, and a new menu will appear from which you will select Option 1, as follows:

```
          Name Registration for Primary Name `xxxx'
       ------------------------------------------------
        1.  View ICN Computing Registration Information
        2.  Register for ICN Computing Resources
        3.  Set Default Charge Code
        4.  Set E-Mail Forwarding Address
        5.  Set URL WWW Homepage
        6.  Create a New Secondary Name
        7.  Edit an Existing Secondary Name
        8.  Delete `xxxx'
        9.  Give `xxxx' to Another User

 Enter option [RETURN to exit]:
```

When you select option 1, your existing E-mail address and the various E-mail and compute server registration information will appear as follows:

```
Primary Name : abc      Owner : 012345
   UID: 1059
   E-mail Forwarding Address: abc@rhost.lanl.gov
   Default Charge Code: 8h0600x33p00000000

   `abc' Secondary Names :
   u0123435
   big_deal

    System(s) registered on:
   IBM-CLUSTER
   OPEN-CRAYS
   POP (CIC-mail)

    Mailing lists `abc' subscribed to :
    project_j (joe doe, doe@lanl.gov, 505 667-1234)
```

If you do not have an ICN password or would rather not contend with this process, send E-mail to cic-help@lanl.gov with your request.

EWP contains information from the EI database as well as information about Laboratory computer users who are external to or affiliates of the Laboratory. Personal information includes such items as Z-number, name, telephone number, group, fax number, and pager number.

Selecting an E-mail Name

An E-mail name can be something like abc, jsmith, or esalazar3, or martinez_john_a, or david.adams. The E-mail name must be unique. (see Section 4.3.1)

Forwarding Addresses

The forwarding address is where mail, sent to your address @lanl.gov, will really be sent by the central LANL mail server. It will generally look like

`username@machine.lanl.gov`

such as

`u012345@pobox1663.lanl.gov` (a typical POP server mail address)

When Albert Casey registers abc as his E-mail name and u012345@pobox 1663.lanl.gov as his forwarding address, he creates an E-mail address of abc@lanl.gov, which forwards mail to his account on pobox1663.

An EWP entry can also be used to shorten or simplify an E-mail address.

Secondary Names and Lists

You may register other names and distribution lists on the EWP. Secondary names are other E-mail names by which you may receive mail electronically.

5.2.7. How to Change Personal Information

The personal information in EWP is taken from the EI database. Changes to this data can be made only through the EI system. Individuals requiring changes in their personal information should contact the person designated by the group leader as responsible for the group's EI entries (usually your group secretary).

5.2.8. Finding E-mail Addresses

When attempting to send mail, you may not know the E-mail address of the intended recipient. To find basic information about a user, you can use one of the following tools: Finger on UNIX, Ph and Finger on Eudora, and the Phone Book via Netscape.

Using Finger

If you have access to the Finger command on your system, you can use it to access the phone book to search local and most remote sites for users who satisfy a variety of criteria.

Computing/Electronic Mail/How to Change personal Information…

This finger command lists all records that begin with "casey," including people with "casey" as first name, last name, or any name that starts with these letters. Note that two of those on the example below do not have registered E-mail addresses.

```
% finger casey@lanl.gov

012345 Casey Albert B. CIC-6 B251 505-667-7298
abc@lanl.gov
080330 Casey Hugh MST-6 G770 505-665-4719
hcasey@lanl.gov
113162 Casey Nancy N. CIC-3  B265 505-667-7028
114413 Olson Casey D. BUS-1  C121 505-667-1212
```

Computing/Electronic Mail/Finding E-mail Address/ Finger

More information is available from the "long listing" (UNIX "-l option") as shown below.

```
% finger -l casey@lanl.gov

           name: B. Albert Casey
        znumber: 012345
         e-mail: abc@lanl.gov
forwarding addr: u012345@cic-mail.lanl.gov
          phone:505-667-1234
            fax:505-667-6333
   organization: CIC-23
 postal address: MS B294
       location: TA-03 Bldg 0132 Room 534
```

To qualify the search, you can use the first name and encase the string in quotes.

```
finger "jose martinez"@lanl.gov
```

Additional information is available by entering `finger help@lanl.gov.`

Using the Eudora PH/Finger Client
Some systems, like the Eudora mail package, contain a Ph program that has a "point and click" interface. Note that instead of returning a single line of information, the Ph program always gives you the long listing of information for each person.

Using Web Phone Book
The Web Phone Book application is available from the LANL Home Page. Two options are available, a short query form and a more comprehensive query form.


Phonebook

5.2.9. Distribution Lists

Two applications are available to establish E-mail distribution lists.


Computing/Electronic Mail/ Distribution lists

- Listmanager—permits you to create and maintain your own distribution list on the Lab mail host. These lists are "public," which means anyone on the Internet can mail to them.
- JIT-list—permits you to distribute E-mail based on demographic characteristics found in the EI database. For example, users could send E-mail to all the people in a particular Laboratory building or group.

5.3. Hard Copy Output—Print and Graphics Express Station (PAGES)

PAGES provides a variety of printing services available through electronic access via the ICN. You can order any PAGES print service without leaving your office if you have a computer connected to the ICN and the proper PAGES access tools. These tools are now available for Macs and PCs as well as UNIX machines.


Computing/CIC Orgs…, Centers…/CIC-17 Media/PAGES

In most cases PAGES can complete your print job the same day or even within hours. Print jobs can be delivered to your mail stop or distributed to on-site locations per your instructions. Your documents are available for pick up in TA-3, in the concourse of Building 132, the CCF. With PAGES, you can print to a variety of media including the following:

- 35-mm color film (slides),
- 36" color plotter,
- 8.5" x 11" black and white paper,
- 8.5" x 11" color paper or transparency,
- 8.5" x 11" color photo or transparency,
- video (VHS, 8 mm, or U-matic) (Mac and Windows interface is under development), and
- 105-mm microfiche.

5.3.1. UNIX/DOS/VMS Output—PPAGES

The command "PPAGES" sends a variety of file formats such as ASCII text or PostScript to the PAGES output facility for printing on paper, transparencies, or microfiche. PPAGES uses the command "LPR" (line print request) to transfer print jobs to PAGES. Most of the LPR, "LPQ" (line-printer queue), and "LPRM" (line printer/remove files) features are available, but they apply only to print jobs being transferred to PAGES. After a job is accepted by PAGES, call the CCF dispatcher for its status (7-4584).

The PPAGES command requires the specification of the file type and format (see example below). Numerous other options are available (see the "man" page).

```
ppages -ft value -format fmt filename
```

If you do not list any options, PPAGES will assign default values for the format you entered.

PPAGES uses the Kerberos authentication process to validate your print request. You must use the "kinit" command before attempting to send output to PAGES.

PPAGES needs your Z-number and ICN charge codes before the job can proceed. It passes the values of the "environment variables" called "ICNZ" and "ICNCHARGE" to PAGES for accounting and to look up the user's delivery destination. Thus, you must have a valid charge code established.

5.3.2. Macintosh Output—PAGES and MacPPAGES

If you are a Macintosh user, there are two ways to print to PAGES. You can use PPAGES for Macintosh (the "normal" way) or MacPPAGES. PPAGES for Macintosh creates and ships files to PAGES in a single-step process. This is generally preferable; however, you must have AppleTalk capabilities to use PAGES with the "native" Macintosh operating system.

To determine if you have a direct AppleTalk connection to PAGES, open the chooser and verify the AppleTalk zone list for a zone entitled "PAGES." If the "PAGES" zone appears, you have a direct AppleTalk connection to PAGES services. Otherwise your Mac is not connected to a network, or AppleTalk is not routed from your network to PAGES. Contact your local system administrator who may be able to install the PAGES zone.

Assuming you have network access, you must install LaserWriter 8 (you probably already have it) and a set of PostScript printer description (PPD) files for the PAGES devices. These are available on-line in the form of an installer program.

If the "PAGES" zone is not available, you must use MacPPAGES. MacPPAGES is a Macintosh file shipper that manages a variety of formats. Unlike native Macintosh operating system programs, MacPPAGES uses a two-step process to print to PAGES. First select or create a PostScript file, then ship that file to PAGES using MacPPAGES.

5.3.3. Microsoft Windows Output—PPAGES

For Microsoft Windows, the best methods for accessing PAGES services are listed below in descending order.

- Use the Adobe PPD, version 2.1 or later. Like the native Macintosh operating system graphical user interface (GUI), this driver can create and ship files in a one-step process. For detailed instructions on downloading and installing, refer to the documentation in HTML or PDF 1.1MB format.
- Use PPAGES for DOS.
- Use LPR (line print request) for DOS.

The second and third methods are command-line interfaces.

5.3.4. MS Windows Requirements

To use PAGES from your Windows PC, your PC must be on the open network with OnNet/TCP (formerly PC/TCP) installed. You will have to install Adobe's PostScript printer driver for Windows and set up the PAGES devices as network printers. An archive file is available on-line.

5.3.5. Calcomp Printing Services

For large-scale printing, PAGES provides computer-generated monochrome and color drawings via a Calcomp 5835XP electrostatic plotter. This plotter can produce drawings in sizes A through E (8.5" x 11" through 36" x 88") and is capable of creating half-tone or screened color images at 400 dot-per-inch resolution using a 256-color palette and a special dielectric coating. Calcomp allows you to create large color posters, flow charts, electrical/mechanical drawings, and other types of large scale drawing applications.

5.3.6. Novajet III Printing

This plotter is also capable of producing A- through E-sized color drawings on roll-fed bond paper or mylar material. The advantage of Novajet is that it provides extremely high-quality monochrome drawings via continuous-tone, or unscreened, images. The Novajet III is about four times faster than the current Calcomp plotter so turnaround time will be vastly improved. The biggest improvement, however, is in quality.

5.3.7. PAGES Job Status Reporting

A Web interface is now available for querying the status of jobs sent to PAGES. This service allows you to see what jobs you have in the queue, when they were printed, what options were requested, etc. You can query by Z-number, job number, or PAGES queue name. This new service can now be accessed on the Web.

Computing/CIC Groups…/ CIC-17 Media/PAGES/ Check on Job Status

5.4. Transferring and Storing Files

Several methods are available to transfer files between computers and file storage. This section will briefly describe the following:

Computing/Network Resources/FTP

- FTP—Transfer files between Internet hosts,
- CFS—Transfer files to permanent storage,
- NFS—Share files between hosts, and
- ADSM—File backup facility.

5.4.1. File Transport Protocol (FTP)

The FTP facility copies files between IP hosts and offers many options including the ability to delete files, list directories, and change directories on the remote machine. To retrieve a specific file you need the following:

- the name of the remote host (computer),
- an account on that computer (user ID and password), and
- the path name to the file.

The general form of the UNIX command is

```
ftp remote_hostname
```

PCs may use the OnNet (PC/TCP) while Macs will use Fetch and VersaTerm FTP.

When the connection is ready to accept FTP commands, the prompt “ftp>” appears.

Anonymous FTP

Anonymous FTP allows limited access rights to information by users who do not have regular accounts on the remote host by using a special account called “anonymous.” The only operations allowed are logging-in using FTP, listing the contents of a limited set of directories, and retrieving files. Anonymous users are not usually allowed to transfer files to the remote site.

Anonymous accounts typically use “anonymous” as the log-in name and the password “guest” or your E-mail address (if it is requested by the log-in prompt).

Computing/Compute Resources/CFS

5.4.2. Using the Common File System (CFS)

The CFS is used to store files on a permanent basis. CFS is available from all computing partitions. The three following utilities allow you to work with CFS from UNICOS:

- The CFS command utility,
- The Advanced CFS Interface (ACFS) which is available only on UNICOS, and
- An FTP client.

5.4.2.1. The CFS Command Utility

The CFS command utility is available on all ICN production platforms. It is distributed with the ICN software and is available for most UNIX workstation platforms. UNIX workstations must have the ICN software installed to use the CFS command utility. To use the CFS command utility from a UNIX workstation, you must first get a Kerberos ticket; this is not required on the ICN production UNICOS systems. The CFS command utility can be run as a "one-line" command (i.e., "cfs list"). To run the CFS command utility as a "one-line" command, you must have previously set an environment variable ICNCHARGE with the value of your valid ICN charge code. This can be accomplished by using the "setenv" command in the C shell (e.g., setenv ICNCHARGE 12345678). The CFS command utility can also be run interactively by simply entering the command "cfs."

Computing/Compute Resources/CFS/ACFS

Computing/Compute Resources/CFS/CFSGW

The CFS command utility supports a wide variety of subcommands and options. Table 5.2 is a summary of the more commonly used commands. Note that before saving any files on CFS, you must create a root directory.

5.4.2.2. Advanced CFS Interface (ACFS)

ACFS is available only on ICN production UNICOS systems. ACFS provides additional "wildcarding" capability, sorting of LIST output, recursive commands (MASSACRE), preprocessing of files before storing, automatic decompression, use of the "NTEXT" command, and other processing using the "GET" command.

5.4.2.3. FTP Client

Normal FTP clients that come with most UNIX workstations and with all production ICN machines can be used to access the CFS. FTP clients that run on personal computers (both Macintosh and Windows) can also be used to access the CFS. The host name to "FTP" to is cfs.lanl.gov. The log on is the basis of authentication, and no further authentication is required.

From a UNIX or VMS platform, enter the following: "ftp cfs," your log-in moniker (Z-number, Z-number prefaced with a U, user's initials, first name, last name, or combination thereof, depending on the system), and your ICN password when prompted. You will normally be put directly into your default CFS directory (usually /Z#, i.e., /123456). Then you can use "cd" or change directories to whatever directory you wish, and use normal FTP commands ("get," "put," etc.) to perform the desired FTP function.

Graphical FTP clients, such as Fetch (Macintosh) can be used to connect via FTP to the CFS. Point the client to the CFS with your moniker and ICN password. As when you use the standard FTP, you will be placed into your default directory. There is one major difference with these types of graphical clients when accessing CFS versus accessing standard FTP sites. To reference a top-level directory tree other than your default CFS directory tree, you cannot use the normal GUI point-and-click means. Most graphical FTP clients have a menu option that allows them to change directories; at that option you can type the path to the desired directory. If that does not work, look for an option that

will allow you to issue a typed FTP command. There you enter the command "d=/path" where /path is the full path to the directory (or to the parent directory so that the graphical nature of the ftp client can take over). Many graphical FTP clients (e.g., Fetch 3.0+ and Anarchie) remember all of the directories that you have visited at a particular FTP site, so you can still "point and click" your way around the CFS.

Table 5.2. BASIC CFS Commands

Function	Typical Command
Create root directory with user number as name	**cfs create**
Create named root directory	**cfs create/named root**
Overwrite a CFS file	**cfs replace filename**
Save a new file or overwrite an existing file	**cfs store filename**
Save a new file to another root	**cfs save /named root/file**
Retrieve files	**cfs get filename**
Delete files from CFS	**cfs delete filename**
Turn off delayed delete (24 hours)	**cfs delete delay=off filename**
Recover deleted files marked as "dying"	**cfs rescue filename**
List CFS files and subdirectories	**cfs list**

5.4.3. Network File Service (NFS)

Computing/CIC Organization/ CIC-11 Data Storage System/ Network File System

The NFS servers offer a storage capability for workstations, desktop computers, supercomputers, and all other computing platforms around the Laboratory. The NFS servers provide a remote UNIX "filesystem" that looks and acts like a local file system. Projects large and small can utilize this service to provide centrally located files that are available to remotely located desktop computers, workstations, and ICN compute servers (i.e., Crays, Cluster, and Connection Machines).

Employing NFS can reduce disk purchases and your project's file system administration and set-up problems involving file sharing across multiple computing architectures.

The NFS service includes the following features:

- Daily backups of your data to ADSM in the open or secure environments,
- 24-hour help via pager 104-8290 (to an NFS system administrator) 7 days a week,
- Access for your questions or problems or suggestions through E-mail (nfs@lanl.gov),
- Economy ($35 per gigabyte per month—with unlimited access),
- Server access via fast fiber-optic connections to the LANL "backbone,"
- Server power connected to an uninterrupted power supply,
- Server location in a secured and controlled-area access computer room (CCF), and
- Files up to 2 gigabytes.

5.4.4. ADSTAR Distributed Storage Manager (ADSM)

Computing/CIC Orgs…/ CIC-11 Storage Systems/ADSM

ADSM is a client/server software product that provides full and selective backup and archival services for client machines such as PCs, Macs, many UNIX-type machines, and NFS file servers. ADSM can back up the client machine automatically according to a schedule requested by the user, or the client can be backed up manually by the user at any time. Initially, ADSM does a full backup of a workstation; thereafter, it copies only those files that have changed since the last backup. A "restore" of a backup at the "file" level can be done at any time, and all file attributes (permissions, etc.) are restored.

To use ADSM, you must first register your workstation with the ADSM server on the Web.

To complete registration, you must have your machine's network node name, your cost code and program code, and your Z-number. You will also be asked to set your own ADSM password for access, to choose one of four automatic backup schedules (6 p.m. to 6 a.m. is the default), to choose when or if you want to be notified that an automatic backup has failed, and to choose who (if not you) should be notified if it has failed. You can also register by E-mail if you provide the necessary information to adsm_help@lanl.gov.

There is a one-time registration fee to pay for the software license from IBM; a monthly service charge, which covers unlimited backups; and a monthly storage fee.

5.5. The World Wide Web (WWW)

The WWW enables anyone to locate on-line information that pertains to his/her particular field of study. The Web provides a suite of functions including the following:

- text retrieval,
- keyword searches,
- file transport/transfer protocol (FTP) file retrieval,
- access to Telnet-based servers, and
- retrieval and display of graphic files.

5.5.1. Responsible Web Use

Computing/Network Resources/WWW/ Responsible Web Use

At Los Alamos National Laboratory, we recognize and value the Internet as a diverse, decentralized, and robust mechanism for publication, communication, and research. We support the responsible use of the Internet and encourage the Laboratory community to make use of modern communications tools such as electronic mail and the WWW. As a national laboratory, we have unique obligations to protect the property and interests of the United States government. In order to promote these goals, we adopt the following guidelines for responsible use:

1. Promote the sharing of information.
2. Protect sensitive and classified information.
3. Use the Internet for official purposes.
4. Demonstrate professional, ethical, and courteous use.

5.5.2. Getting Set Up to Use the Web

The Web can be run from a text-based workstation using Lynx (Gopher is no longer available) or from "browsers" such as Netscape. To access Lynx, "Telnet" to "www.lanl.gov 1664" and select "Lynx" from the menu.

It is very important that your workstation have the Telnet feature installed and properly configured. If you are unsure if this capability is available to you, check with your system administrator.

Computing/ Software Distribution via On-line/ Electronic Software Distribution

To access the Web you need the following:

- A workstation such as a Macintosh, PC or UNIX platform,
- A physical connection to the Los Alamos network,
- A Web "browser" (Netscape site license is available).

Access the Web by entering the browser command "NETSCAPE" or click on the related icon. Although many functions are intuitive, there is a button on the browser labeled "HELP," which will lead you to additional information on using the Web.

The "home page" is the beginning point for entry into a primary Web information environment. To go directly to a Web site or home page, you can use its Universal Resource Locator (URL) or path. There are several types of URLs, but the form that selects a Web site for browsing is similar to http://www.lanl.gov.

To enter a URL, you may either select "File" from the main menu on the Web browser and, from the menu displayed, click on "Open Location," or click on the open button on the tool bar. This will open a small window into which you will type the desired URL and then click "Open."

If you have set your browser to default to the LANL home page, then clicking on "home" will take you to the LANL home page. From this home page you can click on any underlined or highlighted topic to move you through the LANL Web pages and link to the information contained there. To establish LANL as your home page, follow the steps below using Netscape:

1. From the very top tool bar, pull down the "Options" menu,
2. Select "General Preferences,"
3. Click on the "Appearance" tab,
4. Under "Browser starts with:" click in the "Home Page Location" box,
5. Type: //www.lanl.gov, and
6. Click the "OK" button.

If a Web reference returns the error "Unable to find Application" this may be caused by the need to configure your browser to point to a Telnet application. To accomplish this, follow these steps below using Netscape:

1. From the very top tool bar, pull down the "Options" menu,
2. Select "Preference" (or "General Preferences"),

3. Click on the “Applications” (or Apps) tab.
4. Enter the following workstation-dependent information shown in Table 5.3 in the space provided:

Table 5.3. Netscape Application Entries

	UNIX	PC	Mac*
Telnet Application:	xterm -e telnet %h %p	Windows-dependent see Table 5.4.	click on browse select Telnet
TN3270 Application:	xterm -e tn3270 %h	c:/pctcp	
Rlogin application:	xterm -e rlogin %h	N/A	
Rlogin with User:	xtrem -e rlogin %h -1 %u	N/A	
Temporary Directory:	/tmp	c:/temp	

*Must have NCSA Telnet installed

Table 5.4. Windows-Dependent Telnet Locations

Windows 95 (also NT)	c:\windows\telnet.exe
Windows 95 (OnNet)	c:\onnet32\wtnvt.exe

5.6. Network Information Resources

There are a wide variety of information resources available from the ICN and its connection into the Internet. This section will preview some Web pages.

5.6.1. Research Library Home Page

http://lib-www.lanl.gov

The Research Library’s home page provides a link to general information about the Research Library including its collections, services, and publications, as well as links to other resources. Some of these resources are the Library’s On-line Catalog, which is used for locating books and journal titles in the collection; subject resources for locating Internet information on physics, chemistry, biology/genetics, business, etc.; and Los Alamos publications including LA reports, *Dateline Los Alamos*, *LA Science*, and *Research Highlights.*

Major effort has gone into the Subject Resources page. Librarians in the Research Library have responsibility for selecting appropriate Internet resources (such as the “Table of the Nuclides” and “Standard Atmosphere Computation”) in their assigned subject areas.

5.6.2. Library Without Walls (LWW) Project

Research Library/

Several efforts within the LWW project are currently in progress. First is the on-line electronic document effort, which has a goal of capturing and displaying all Los Alamos report files in electronic form. The viewer for these report files is Adobe Acrobat, which creates files in PDF. Adobe Acrobat will run cross-platform on IBM DOS or Windows, Macintosh, and Sun SPARC UNIX. (Acrobat is available free from CIC-2, 7-4357.)

5.6.3. Web Access to SciSearch Database

http://lib-www.lanl.gov/ Electronic Database

The Research Library has a new database, SciSearch, which is based upon the Science Citation Index SciSearch Database, an international multidisciplinary index to science and technology literature produced by the Institute for Scientific Information.

5.6.4. Network News Facilities

ClariNews

ClariNews is an electronic newspaper containing professional news and information delivered to your computer in the "usenet" news format and is updated continuously all day long. You can receive ClariNews through a standard news reader if your system is so configured.

USENET News

USENET news is available from machine newshost.lanl.gov. You can access the news via several client news reader programs. Your workstation must be on a LANL network to read news from newshost.lanl.gov.

6. LABWIDE BUSINESS INFORMATION SYSTEMS

Labwide business information systems (aka, Labwide systems) provide access to a wide variety of administrative information and resources. The Labwide systems have been designed to serve a wide range of users including clerical and technical support staff as well as management and professional staff. Labwide systems are run on the IA and IB machines, client-server applications, and the Web, and they can be accessed with PC, Macintosh, or UNIX workstations.

Labwide systems do not include all the computer systems available at the Laboratory. They are information systems used by people “Labwide” as opposed to information systems used for special interest groups or computer systems used for scientific computing. Some of the Labwide systems such as Time and Effort, Travel, and Employee Information may be used by all employees. Other applications (e. g., Salary Review, Payroll) are specialized and require specific authorities for access.

The Labwide systems you use will depend on the tasks you perform on your job. To use Labwide systems, you need the following:

- Communication links and the software to connect you to the computers where the Labwide systems reside (Section 2, Table 2.4);
- An ICN password and/or Smartcard to permit access to the IA and IB machines, the Client-Server GUI systems, and the Web-based systems (Section 2, Table 2.6); and
- System authorities appropriate for the work you need to do.

The standard interface for the Labwide systems has been character- and screen-oriented. There are now several Labwide systems that use GUIs and run in a client-server architecture. The software to use these GUI applications can be downloaded from the ESD Web page. Call the Customer Service Group for assistance with downloading the applications (665-4444, option 5). Some applications (e.g., Data Warehouse, JIT Catalogues) can be accessed on the Web. Call 5-4444, option 2 for assistance in using these applications.

6.1. Labwide Information Systems Descriptions

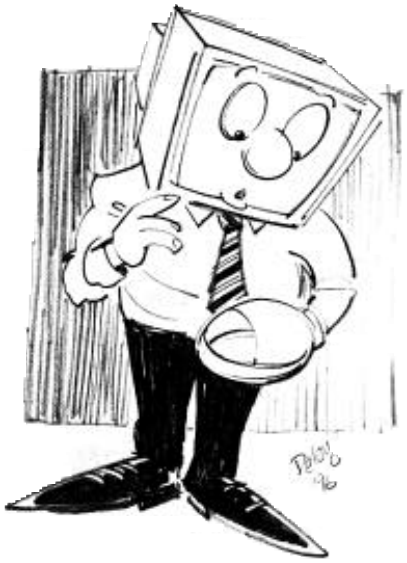
Table 6.1. is an alphabetized listing of all Labwide systems. Each entry contains the name of the system, a short description of the system's function, and the type of computing environment required to access the system. If you need additional information, call 665-4444, option 2.

Table 6.1. Labwide Information Systems Descriptions

System	Description	Access
Account Control	Allows employees to add or update a default charge code, so the system will not ask for one every time the employee logs on to IA.	Log onto IA
Automated Chemical Inventory	Tracks all chemicals and gases purchased for use at the Laboratory from receipt through disposal.	Log onto IB
Affiliate Information	Provides agreement, arrangement, and payment information on affiliates.	Log onto IA
Authors	Tracking and history system for Laboratory research documents. The database contains unclassified bibliographic citations.	Log onto IA
Budget Computing	Used to query historical operating funds.	Log onto IA
Capital Equipment	Records and reports budget activity on capital equipment.	Log onto IA
Data Warehouse	Allows access to financial, employee, and travel information through a GUI. The system uses ad hoc and standard reporting capabilities. (http://datawarehouse.lanl.gov)	Use client-server or Web
Document Request	Allows Laboratory employees to print Labwide system documents through the CCF. (http://iosun.lanl.gov:2001/htmls/infoSys/icn/labwide/labwide.html)	Log onto IA or use Web
Electronic Authorization	Determines access to Labwide systems. Managers use this system to review and assign Labwide Systems authorities.	Log onto IA or IB
Employee Development	Tracks employee training. Laboratory employees may view course information and request enrollment in Lab-sponsored courses. Employees may also request a transcript that lists all the courses they have taken at the Laboratory.	Log onto IB, client-server, or Web
Employee Information	Displays employee salary, history, and directory information (i.e., personal, location, and address information for all Lab and non-Lab employees).	Log onto IB
Facilities Project Information/ Work Order	A central project-tracking system designed to track work order costs and multiple construction projects from inception to completion.	Log onto IB
Financial Management Information	Provides managers, Business Operations Division personnel, and others with a way to keep track of	Log onto IB

System	Description	Access
	the financial status of organizations or programs within their domains. Costs, allocations, and outstanding commitments information can be retrieved from the system, and reports can be generated.	
Hazardous Material Transfer Tracking	Provides electronic creation and approval of Hazardous Material Transfer Forms and Radioactive Material Transfer Forms.	Log onto IB
JetForm Filler	Used to fill out official Laboratory forms (Travel, training, purchase requests, personnel action notices, etc.). (http://iosun.lanl.gov:7000/devl/htmls/forms.html)	Use the Web
JIT Catalogs	Allows employees to browse the on-line Catalogs and perform searches by descriptions and part numbers.	Use the Web
Key/Core	A subsystem of Employee Information used to track keys, cores, and padlocks fabricated by the Laboratory Lock Shop.	Log onto IB
Mail Channels	Contains source document numbers, names, and addresses of authorized recipients, document security levels, and special instructions and restrictions that pertain to transferring documents to authorized external personnel.	Log onto IA
Performance Appraisal	Allows managers to generate statistical reports (before 6/20/95) about outstanding appraisals. For current data, look on Data Warehouse or Employee Information.	Log onto IA
Personnel	Displays employee attendance (previous to 12/31/95), salary, history, and benefits information.	Log onto IA
Property Accounting, Inventory, and Reporting	Automates the process of property management and administration. It provides a central repository of property management information for active, excess, and retired property.	Log onto IB
Purchase Card	Allows on-line reconciliation, approval, and review of monthly statements of account.	Use client-server
Purchasing, Accepting, Invoicing, and Disbursing	An accounts payable purchasing system that deals with all purchase requisitions that become purchase orders. Once the purchase order is received, it is processed into this system, and an invoice is created to pay the vendor.	Log onto IB
Receiving/Procurement Inquiry	Displays information on purchase orders. Location and status of items received at the Laboratory can also be determined.	Log onto IA

System	Description	Access
Salary Review	Automates the process of distributing funds for salary increases.	Log onto IA
Secretarial/Contract Services	Provides the capability of requesting temporary secretarial services and/or contract services. The process for requesting these services is fully automated, from creating the request through notification and approval. Contract employees use this system to report their time.	Log onto IB
Signature Authority	Line managers use this system to assign authorities so their employees can purchase materials. This system is also used to authorize individuals to transport hazardous materials by interfacing with Employee Development to check the individual's training history.	Log onto IB
Stores	Provides on-line stock catalog searches. Orders for vendor and warehouse items can be placed and their status monitored.	Log onto IA
Time & Effort	Allows Laboratory employees to enter their own time and effort on-line. It also allows a designated timekeeper to enter time and effort for other employees. Line managers can approve time and effort on-line as well.	Log onto IB or use client-server
Travel	Allows employees to submit and approve travel expenses on-line. Because of Internal Revenue Service regulations, the traveler must sign the summary sheet, attach the travel receipts to it, and send it to the Travel Office for storage.	Use client-server
Work Request	Providers for the on-line entry, routing, approving, screening, and tracking of a work request.	Client-server or Web



6.2. Authorities

To view or update information in Labwide systems, you need to have authorities unique to each system. Lab employees and most contract employees are given limited authority automatically to view their own data.

If your job requires you to see group or division information, you need additional authorities. In most cases, line managers assign additional authorities to their employees.

Call the CSC at 665-4444, option 2, or E-mail labwide@lanl.gov for help with system authorities.

6.3. Training, Documentation, and Consulting

Computing/Training

Classes are available monthly to people who use Labwide Systems. Most are half-day classes. For information or to register for classes call 665-4444, option 4, or 7-9559. Course descriptions and scheduled class dates are on the Web.

Training is offered as needed for the following systems:

- Automated Chemical Inventory
- Data Warehouse
- Employee Development
- Employee Information
- Eudora
- Financial Management Information
- HTML
- Infomaker Reports
- Key/Core
- Netscape
- On-line Forms
- Property Accounting, Inventory, and Reporting
- Purchase Card
- Signature Authority
- Salary Review
- Stores
- Time & Effort
- Travel

Computing/ Documentation/Business Information Systems/Lab-Wide System User Guides

Many of the systems have reference cards containing quick instructions for using the system. You may obtain a reference card or an entire document via the Web.

Computing/Consulting Support/Lab-Wide Systems Consulting

For consulting services, call 5-4444, option 2.

7. SCIENTIFIC COMPUTING

7.1. Compute Servers

This section will help you choose the operating system and computer combination that are best-suited to your computing needs by presenting a brief description for each operating system. Each description includes pertinent access information for each operating system, its typical uses, limitations, and characteristics.

The optimum system for a given computer application will vary with the characteristics of the code. The use of floating-point operations, the percentage of vectorized code, and the average vector length for the codes are some of these characteristics. Use the "Register" facility to obtain an account on the compute servers described in this section. Follow the steps below to register for access to ICN compute servers.

- Log in to the Register facility [see Section 4.3.],
- Select Option 1 "Go to name registration."
- From the subsequent menu select Option 2 "Register for ICN Computing Resources."

Computing/CIC Org…/CIC-7 Computing/

A complete list of compute servers is found on the Web.

7.1.1. Cray UNICOS

UNICOS is used primarily for scientific computing with emphasis on large programs that require extensive calculations and significant internal storage. UNICOS supports a software-rich environment for many traditional computing applications. Large memory allocations per user on UNICOS permit effective and efficient computing of large problems. You can perform multiple computing tasks (with some limitations) by moving processes to the background.

Computing/Documentation/Technical/Subject Listing/UNICOS/UNICOS at Los Alamos User Guide

Documentation in support of UNICOS can be obtained by calling Cray Research, Inc. at (612) 683-5907.

Computing/Computing Services…/UNICOS at Los Alamos

The UNICOS operating system provides a UNIX-based System V environment, which conforms to the POSIX 1003.1 standard. This includes Berkeley Software Design, Inc. (BSD) extensions to the System V and sessions (similar to BSD job support), symbolic links, long file names, and signal support.

Many performance tools are available with an X Windows System interface that makes hardware performance features much more accessible. The output of these tools can be shown and manipulated graphically, which allows you to interpret performance parameter relationships easily and optimize their codes.

UNICOS itself does not provide for magnetic tape input or output. You may read and write magnetic tapes through the IES (Import/Export System which is an extension of CFS), where they would be accessible from UNICOS.

A locally developed CPU scheduling algorithm, known as opportunity scheduling is installed on all UNICOS systems. The objective of "opportunity scheduling" is to give users direct control over their available CPU time. By adjusting user-adjustable priorities and relative shares, a user organization can ensure that its most important work is always completed, irrespective of the total load on the machine. (UNICOS previously used a process called the "fair share scheduler" to allocate resources).

Computing/Compute Servers/ UNICOS/Opportunity Scheduling

Computing costs are calculated by charging for the use of specific UNICOS resources based on whether the computing is interactive or batch-type as submitted through the production- or batch-workload manager.

Computing/Computing Resources/Charge Rates

7.1.2. Gamma YMP (UNICOS)

Gamma's CPUs are identical to those on the other YMPs, and both Gamma and the other YMPs run on a 6.0-nanosecond clock. The charge rates are lower because Gamma uses a slower, less expensive memory technology known as "Dram." Longer fetch times cause the CPU to spend more time waiting for data. The exact delay depends on the application, but on average processes take 15% longer to run. The reduced CPU charge for Gamma compensates for the longer CPU times, ensuring that, on the average, applications will cost the same to run on Gamma as they would on any other YMP.

An advantage of using Gamma is that there are two gigawords of 64-bit core memory—ideal for fine meshes and three-dimensional calculations. Smaller, open-partition jobs should be submitted to "rho," where codes will often run faster.

7.1.3. Massively Parallel Supercomputing—T3D

The Cray T3D massively parallel supercomputer is a true multiple-instruction, multiple-data (MIMD) machine located in the secure environment. Previously, all massively parallel processor (MPP) code development in the secure ICN had been of the single-instruction, multiple-data (SIMD) variety provided by the Thinking Machines Corporation (TMC) CM-200. In SIMD machines, the same instruction is executed by every processor on a different set of data. MIMD machines such as the T3D and the TMC allow the execution of different instruction streams simultaneously on different sets of data.

The T3D has as its front end an 8-processor Cray YMP with 128 megawords of 64-bit static random access memory (SRAM) for operating system functions such as I/O and process management. The T3D and YMP, which are known collectively as machine Tau, provide 512 DEC Alpha EV4, 150 megahertz processing elements (PEs) distributed over the high-speed "Torus" network. These PEs have access to 32 gigabytes of distributed SRAM memory, four times that available on the CM-200.

The T3D is suited to jobs appropriate for an MPP system: your application must be parallel, it must be distributed among the processors efficiently, and it must keep all processors busy with useful work almost all of the time.

7.1.4. The Connection Machine CM-200

The CM-200 is a parallel computer built by TMC. The CM-200 consists of 65,536 bit-serial processing units, each with its own memory, interconnected by sophisticated routing circuitry. The system includes 2,048 floating-point chips for scientific computations (one per 32 processors), four high-speed frame-buffer displays, a 160-gigabyte mass storage system (the Data Vault), and a total of 8 gigabytes of RAM (random-access memory). Peak execution rates for 32-bit arithmetic approach 20 gigaflops for the full system.

Special validation is required to use the CM-200, which is accessed by logging on to a Sun front-end (CANYON/RENDIJA) via the ICN secure LAN.

The design of the CM-200 is SIMD, which means that each processor in the machine executes exactly the same instruction at exactly the same time, but on its own piece of data. Conditional operations are handled by masking processors on which the operation is not to be performed. In other terms, the CM-200 is a data-parallel computer in which a given operation is done on many data in parallel.

The full range of UNIX programming tools is available on the Sun front-end machines, but TMC also has provided enhancements to the Emacs editor for program development and a simulator that runs on UNIX, Symbolics, and Macintosh systems. The user program actually runs on a Sun front-end machine, with the CM-200 being fed a stream of instructions through a special interface in this machine. This instruction stream is read by part of the CM-200's hardware, which then orchestrates the parallel execution of the commands on all the processors. Data to be transferred into or out of the CM-200 may be sent directly through the front-end or via the Data Vault, which has an Ethernet connection to the LAN.

7.1.5. Open Cluster

Computing/Computing Services and Resources/Cluster

The Open Network Computer Cluster (ONCS) is intended to offer you a low-cost alternative to the Cray YMP. It is suitable for large-memory, parallel jobs with moderate I/O requirements. The cluster currently consists of eight IBM RISC System/6000 Model 590 workstations and two RISC System/6000 SP-2 running AIX, IBM's implementation of UNIX. Each node has a 66 megahertz clock. These machines are "super-scalars" meaning they can execute more than one command per CPU clock cycle. File size limitation is 2 gigabytes.

Charges for the ONCS are based on CPU time, memory, and disk usage. Check your resource usage by typing

```
/usr/local/bin/get_usage
```

7.1.5.1 Converting Code to Run on a Cluster

Code that runs on a UNIX workstation should run with minimal modifications on any individual node of either the open or secure cluster. The current approach for running in parallel among multiple nodes is to modify code to call the Parallel Virtual Machine (PVM) library, which takes care of all communications between machines. Alternatively, you can use the message-passing interface (MPI), or if you are using FORTRAN, use high-performance FORTRAN (HPF).

7.1.5.2 Balancing and Distributing Workload with Load Sharing

The Load Sharing Facility (LSF) from Platform Computing Corp. is a load-sharing and distributed batch-queuing software suite. LSF integrates a network of UNIX systems to reduce interactive response time, increase batch throughput, and improve computing resource accessibility while supporting parallel applications. LSF schedules jobs based on the availability and load of heterogeneous hardware and software resources as well as on the resource requirements of the jobs, ensuring that jobs run on the best available machines. Fully transparent remote processing of jobs is supported, including remote terminal I/O, signals, and file access. Job accounting data and analysis tools are also available. LSF is highly fault-tolerant and supports job checkpointing and migration. A Motif-based GUI to interface with LSF is also available.

The Open Cluster is accessed via Telnet, FTP, klogin, or kshell from another open machine. After you log on to the Open Cluster machines, you need a Kerberos ticket for CFS access. The available Kerberos commands are “k4init,” “k4rlogin,” “k4rsh,” “k4rcp,” “k4list,” and “k4destroy.” Accounts for new users are added manually.

7.1.6 Secure Cluster

For maximum efficiency and usability, the Secure Network Computer Cluster (SNCS) has been configured with a front end machine and 8 compute nodes. The front end is a Hewlett Packard (HP) H70 with dual CPUs, 256 megabytes of memory, and 4 gigabytes of redundant array of inexpensive drives (RAID) disks. Each of the compute nodes is an HP735 with 400 megabytes of memory (the maximum allowable for this architecture) and 4 gigabytes of RAID disks. All nine machines are currently interconnected via a fiber distributed-data interface concentrator. Currently, HP/UX (the HP version of UNIX) allows files as large as 2 gigabytes. Performance benchmarks are available by sending E-mail to cluster_team@lanl.gov.

The use of a front-end interface allows separation of interactive and compute-intensive jobs. Although not currently enforced, the intention is that the front-end (HP-00) be used for interactive work, freeing nodes HP-01 through HP-08 to run noninteractive or batch jobs. This configuration provides a good environment for evaluating various schemes for load-leveling, an important consideration in a cluster environment.

Computing/Computing Services and Resources/Charge Rates

Charges for the SNCS are based on CPU time, memory, and disk usage. Check your monthly resource usage by typing

```
/usr/local/bin/get_usage
```

You can estimate the cost for your usage by multiplying usage by charge rates.

Type “man get_usage” for more information. For charging purposes, set your default charge code in the secure ACS database. This can be done from a secure Cray with the command

```
acs set default
```

The SNCS is accessed via Telnet, FTP, “klogin,” or “kshell” from another secure machine. After you log on to the SNCS machines, you need a Kerberos ticket for CFS access. As on the open cluster, the available Kerberos commands are “k4init,” “k4rlogin,” “k4rsh,” “k4rcp,” “k4list,” and “k4destroy.” Accounts for new users are added manually.

PVM is installed on the SNCS via a link to the secure infoserver. This link will provide the most up-to-date and architecture-specific version of PVM.

7.2. Software Cross-Reference Tables

Table 7.1. Languages, Libraries, Maintenance, and Debuggers

Component	UNICOS	Cluster	CM-200
System Libraries	ASDEF CFTLIB LIBSCI		
Mathematics Libraries	CRAYMATH IMSL	CLAMS MAPLE*	CLAMS MATHEMATICA*
Graphics Libraries	CGS, GKS CGSHIGH, RSCGI DISSPLA, SC4020 NCAR PXXLIB	CGS CGSHIGH OPEN GL3D NCAR PHIGS ILW3D	
Source Maintenance	HISTORIAN BLS, LD	GNUMAKE	
Debuggers **Static** **Dynamic**	CDBX, DBX LDB CTRACE	DBX XLDB GNUGDB	
C **FORTRAN 77** **FORTRAN 90** **Lisp** **Pascal** **Basic** **Cobol** **Perl**	C, SCC CF77, CFT77 F90 PASCAL	C, C++, GCC,GCC+ F77 F90*, XL	C CMF LISP Perl

*open cluster only

Table 7.2. ICN Accounting Information

Utility	System Access	Function	Options and Features
AUTOSUM	UNICOS	Retrieves account information from "use" databases.	Interactive; permits accessing information by system, user, etc.
COST	UNICOS	Easy to use utility for extracting cost from "use" databases.	Numerous menus. AUTOSUM database.
ACS	UNICOS	Reports account information. Sets charge code authorization.	Computes resource use. Validates user charge codes.
JA	UNICOS	Detailed accounting for jobs.	Many options, see "man" page.

Table 7.3. ICN On-line Help Information

Facility	System	Function	Options and Features
WWW	local	Browse LANL or the Internet.	Use NetScape Browsers.
MAN	UNIX UNICOS	Quick reference information about utilities and command syntax.	Lists commands and keywords. Displays information for commands.
CLAMDOC	UNICOS	Mathematical library information.	Retrieval by routine name, category, or keyword.

Table 7.4. Text Editors

Editor	Systems	Key Options
VI	UNIX	Standard UNIX editor, multiple file access, subset of EX editor.
Visual Editor	UNICOS	Automatic indent and tab set.
EMACS	UNICOS Cluster	Cray supported.
FRED	All	Standard ICN line editor, DO loop extensions. Strong command set Conditional IF functions.

7.3. Graphics Facilities

7.3.1. Device-Independent Graphics

At Los Alamos, the graphical display of data has become an important scientific tool for users of the ICN. Device-independent computer graphics are provided on most of the computing systems at Los Alamos by the Common Graphics System (CGS) and various graphics libraries. CGS provides a foundation for your application programs and higher-level plotting libraries by providing two-dimensional, device-independent graphics primitives. Higher-level graphics libraries built on top of CGS include CGSHIGH, DISSPLA, and the SC4020 emulation library. (See Figure 7.1. on page 62.)

CGS is an evolving product. It was designed to adapt to changing display technology and computing environments while remaining general purpose, flexible, and easy to use. It provides a constant interface to device-level graphics in a changing world. Device formats currently supported by CGS include the X Windows System, Silicon Graphics Distributed Graphics Language (DGL), SunWindows, Tektronix terminals and emulators, PostScript, and the CGS metafile. The CGS metafile is a device-independent representation of graphics that can be plotted on PAGES graphics devices or postprocessed by PSCAN and displayed on any CGS-supported graphics device. CGS is supported on UNICOS, the cluster, VMS, ULTRIX, OSF1, and all of the workstations using the UNIX operating system at Los Alamos.

CGS supports graphics primitives including points, lines, polygons, and text. Both hardware and software text are supported including 19 fonts with text size and orientation control. Many primitive attributes are supported including line style, line width, intensity, direct color, and indexed color. Interactive cursor input is supported on interactive devices. All of this is done in a way that allows your application program to remain independent of any specific graphics device. In addition, device-specific features are available if needed via a CGS escape function.

Computing/CIC Org…/ CIC-8…/The Graphics and Visualization Team/ Graphics and Visualization Software/Software at a Glance

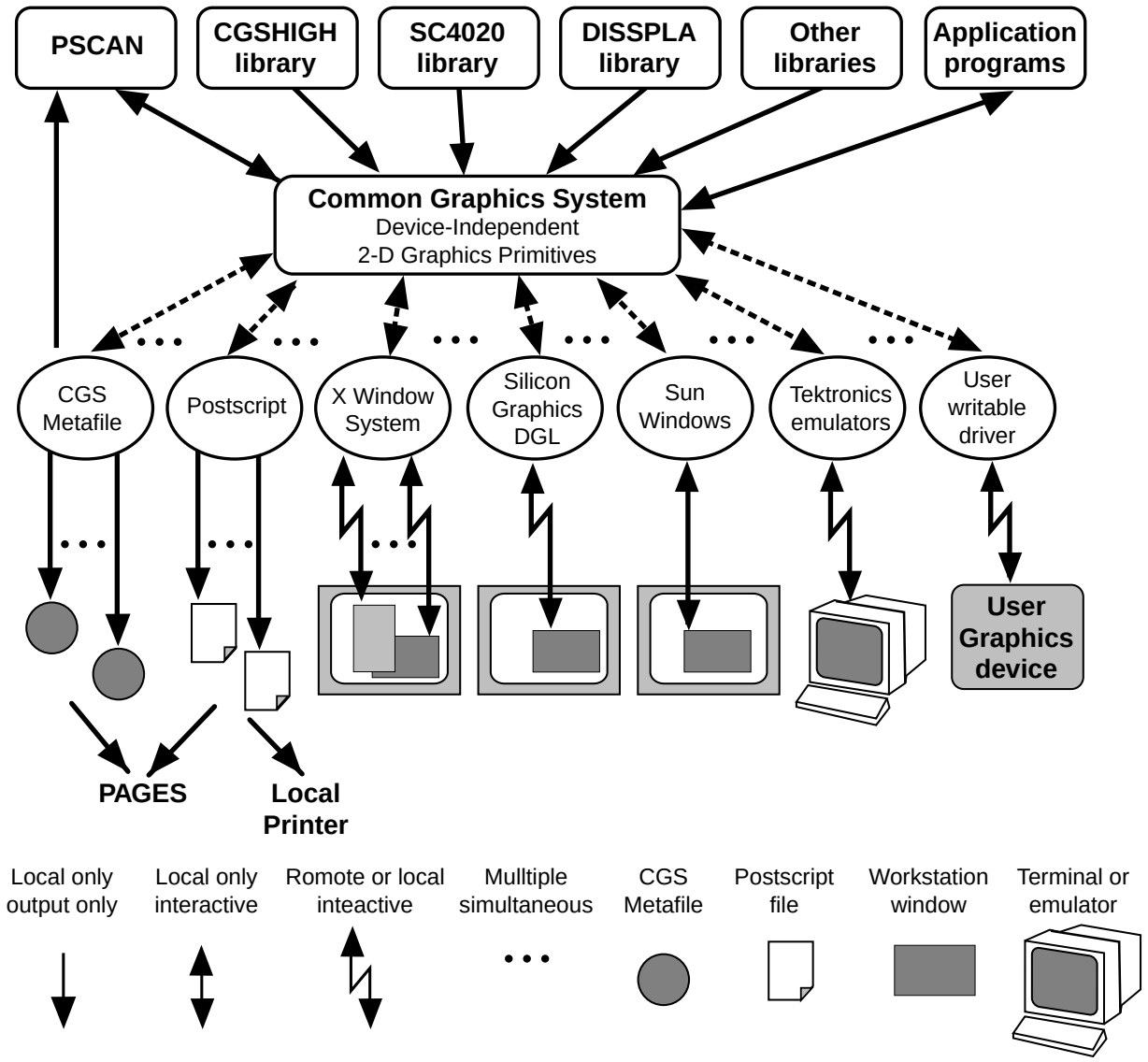
An excellent table that summarizes the various graphics libraries, utilities and postprocessors is found on the Web.

7.3.2. Graphics Devices

Most of the popular capabilities of the various graphics devices that are supported include the ability to display sequences of plots as movies, to have multiple simultaneous windows open, to resize plots within windows automatically, to control multiple windows on more than one workstation from a single process, and many other features as appropriate to the device. CGS also provides a mechanism for the user to write his/her own CGS device driver for nonstandard graphics devices.

Users can plot on one or more devices simultaneously or selectively control which device is to receive graphics output. The process of selecting a different graphics device is as simple as changing a subroutine call to select that device.

Figure 7.1. Current Structure of CGS



Computing/CIC Groups, Centers…/CIC-17 Media/PAGES

Many CGS applications are gaining access to X Windows and PostScript with a minimum of effort. The average Fortran or C programmer probably spends less than half an hour converting an application program to X Windows and PostScript output.

7.3.3. Virtual Reality (VR)—CIC-8

VR is a form of computer graphics that seems to immerse the user in a synthetic space. This is done by using the following:

- One or more computer-graphics-rendering engines for generating viewable surfaces,
- Head-mounted display for viewing the virtual world while masking out the real world or, alternatively,

- 3-D liquid crystal glasses for viewing stereoscopic images projected onto a screen,
- Data gloves and body suits for detecting positions and movements of the participant,
- Position trackers to measure the location and orientation of the head and perhaps other objects,
- 3-D sonification for creation of an aural environment, and
- Voice recognition equipment.

The VR machine allows you to have the experience of being "inside" the model. By using the kinematics of your body to move around the model, the VR machine greatly enhances the understanding of spatial inter-relationships.

http://www-c8.lanl.gov/graphics_vis/vis_video_lab/map.html

7.3.4. Visualization/Video Laboratory—CIC-8

The Visualization/Video Laboratory can help you sort through the many choices available to leverage this powerful technology efficiently. Visualization/video services include the following:

- Consulting and assistance on visualization tools, techniques, software, and methods;
- Coding of specialized routines for project specific goals;
- Animation production from computer-generated data including recording facilities for PAGES production videos;
- Interactive recording sessions directly from workstation screens;
- Editing, titling, and audio dubbing of visualization videos;
- Creation of digital video for delivery via the Internet; and
- Translation between various graphics file formats.

http://www-c8.lanl.gov/graphics_vis/vis_software/vis_sw.html

Work in the Visualization/Video Laboratory relies on a mix of software from three categories: locally developed, freeware/shareware, and commercial. A list is also maintained of the various software in use at visualization laboratories around the country.

http://www-c8.lanl.gov/graphics_vis/vis_video_lab

7.4. Mathematical Software Libraries

CIC Division maintains a large and valuable collection of mathematical and statistical software. Many of the libraries mentioned below are available from the "netlib" facility at Oak Ridge National Laboratory. Any source code available through this Mosaic interface is free of charge, but it will not be guaranteed.

Below is a list of Los Alamos' mathematical and statistical libraries that are available on various computers maintained by CIC Division.

http://www.netlib.org

- General mathematics and statistics—IMSL (on Cray PVMs)
- Eigensystem solvers—EISPACK (in CLAMS)
- Linear Equation Solvers—LINPACK (in CLAMS)
- Nonlinear Equation Solvers—MINPACK (in CLAMS)
- Ordinary Differential Equations—ODEPACK (in CLAMS)
- Technical Computing Packages—Mathematica and Maple

http://saaz.lanl.gov/math/Math_Home.html

7.4.1. Common Los Alamos Mathematical Software (CLAMS)

The philosophy of CIC Division is to provide and maintain a common library of all supported mathematical software routines. Mathematical software libraries for the major ICN systems are built from this common source. CLAMS is a result of this philosophy.

The CLAMS library contains most of the routines in the SLATEC Common Math Library as well as routines unique to Los Alamos. The CLAMS library and associated documentation is on the CIC Division "icn-tools" information server. Currently supported platforms are as follows:

- Cray UNICOS,
- DEC Alphas running Open VMS,
- HP series 700,
- IBM RS 6000,
- Silicon Graphics, and
- Sun.

By mounting the appropriate files from "icn-tools," you will have access to the latest version of CLAMS without using local disk space. CLAMDOC is an interactive on-line documentation program that provides retrieval by routine name, category number, or keyword(s). The utility may be accessed by entering the command "clamdoc" at your terminal. On the DEC machines, the on-line documentation utility "clamdoc" is available. On the UNIX machines, "clamdoc" and the "man" pages for both CLAMS and clamdoc are available. To access files on "icn-tools," contact your local system administrator. Find this software on the Web.

Computing/CIC Groups…/CIC-8…/Graphics & Visualization…/Math software

On UNIX systems, assuming that the files exported from "icn-tools" are in /usr/lanl on the local machine, you should have /usr/lanl/bin in your path variable, /usr/lanl/lib in your LD_LIBRARY_PATH environment variable, and /usr/lanl/man as your MANPATH variable. On Sun workstations, you should be using /mathlib/clams/unix.

gopher://netlib2.cs.utk.edu/11/slatec

On CFS under /ccx/sun you will find "clams.tar" and "clamdoc.tar." Use the command "untar" and check out the "readme" or "make" files. ClamdoC is the documentation program for the CLAMS library.

http://www.netlib.org:80/slatec/

http://www.netlib.org/liblist.html

The SLATEC source is available from the Web.

http://www-c8.lanl.gov/dist_comp2/MATH/clams.html

New CLAMS documentation is available on the Web.

7.4.2 International Mathematical & Statistics Library (IMSL)

IMSL is a commercial, proprietary subprogram library developed by Visual Numerics, Inc. It contains about 4000 FORTRAN subprograms that handle a variety of mathematical and statistical problems. The user command "imsldoc" exists on UNICOS and is the equivalent, for the IMSL library, of CLAMDOC.

The primary usefulness of IMSL for Los Alamos users is in its extensive statistical library, which includes data reduction, multivariate analysis, sequential analysis, random-number generation and probability distribution, permutations and combinations, subset generators, nonparametric statistics, and hypothesis testing. IMSL also provides some subprograms not available in CLAMS, such as operations on polynomial splines, elliptic integrals and functions, and methods for two-point boundary problems.

7.4.3. Mathematica and Maple

Mathematica and Maple are available on the open cluster. Both are software systems for numerical, symbolic, and graphical computations and visualization. Engineers, scientists, financial analysts, researchers, professors, and college and high school students worldwide apply both Mathematica and Maple to critical projects for reliable answers. Both deliver an interactive calculation tool and versatile programming language for fast and accurate solutions to technical problems. Mathematica's electronic documents called "notebooks" let you easily organize your text, computations, graphics, and animation for impressive technical reports, presentations, or records of your work. And you can use MathLink, Mathematica's communication protocol, to exchange information between Mathematica and other programs. Mathematica is available for over 20 computer platforms.

7.5. ICN Account Control System (ACS)

The ACS provides account control for components of the ICN for both internal (Laboratory) and external users. The ACS is available from the UNICOS machines and provides for the following:

- validation of user charges,
- definition and validation of charge codes,
- prevention of overcharging, and
- prevention of charging beyond an expiration date.

When a charge code fails to work, contact your business team leader for your division or group. A list (although often out of date) is found on the Web.

Installation of SLIP/PPP Support and Scripting in Windows 95

SLIP/PPP allows you to dial-up to the LANL Terminal Internet Gateway (TIG) from a remote site using your computer's modem. This article assumes that you already have a modem installed and configured and that you are not connected to any network.

Note: If you have the floppy disk version of Windows 95, you do not have all the files you need. Download the "Dial-Up SLIP and Scripting Support" files from Microsoft to get all the files you will need (http://www.microsoft.com/windows/software/admintools.htm).

There are five basic steps to the installation of SLIP/PPP support and scripting in Windows 95. These steps must be done in order.

I. Installing SLIP Software and Scripting Support

II. Setting Up Properties for SLIP/PPP Connection

III. Configuring the Network

IV. Configuring the SLIP/PPP Connection

V. Setting Up the TIG Log-in Script

I. Installing SLIP Software and Scripting Support

1. Open up the Add/Remove Programs icon in the Control Panel.
2. Open the Windows Setup Tab.
3. Select Have Disk.
4. Select Browse and choose your CD drive letter.
5. Choose \Admin\apptools\dscript.
6. Highlight the rnaplus.inf file.
7. Select OK until you see Components: SLIP and Scripting for Dial-Up Networking.
8. Check the box and select install.
9. Select OK to return to the control panel.

II. Setting Up Properties for SLIP/PPP Connection

1. Open up the Network icon in the Control Panel.
2. Select Network Properties.
3. Under Configuration, do the following:
   a. Click Add and select Client.
   b. Click Add and select Microsoft: Client for Microsoft Networks and then select OK.
   c. Click Add and select Adapter.
   d. Click Add and select Microsoft: Dial up Adapter and then select OK.
   e. Click Add and select Protocol.
   f. Click Add and select Microsoft: TCP/IP and then select OK.
4. Remove any other Clients, Adapters, and Protocols. They are not needed.
5. Under Primary Network Logon, select Windows Logon.
6. Under File and Print Sharing, make no changes.

III. Configuring the Network

1. Highlight Client for Microsoft Networks and select Properties.
2. Under Logon validation, uncheck Logon to Windows NT Domain.
3. Under Network Logon options, Select Quick Logon.
4. Select OK.
5. Highlight Dial-Up Adapter and select Properties.
6. Under Driver Type, select Enhanced Mode.
7. Under Bindings, select TCP/IP.
8. Under Advanced, make no changes.
9. Select OK

10. Highlight TCP/IP and select Properties.
11. Under Bindings, select Client for Microsoft Networks.
12. Under WINS Configuration, select Disable.
13. Under IP Address, select IP address automatically.
14. Under DNS Configurations, select Enable DNS.
15. Under Host, enter your System Name (no restrictions).
16. Under Domain, enter "lanl.gov".
17. Under DNS Server Search Order, enter "128.165.4.4" and then select the Add button.
18. Under DNS Server Search Order, enter "192.16.1.2" and then select the Add button.
19. Under Gateway/New Gateway, enter "128.165.7.241" and then select the Add button.
20. Under Advanced, make no changes.
21. Select OK.
22. Select the IDENTIFICATION tab.
23. Under Computer Name, enter any unique name.
24. Under Workgroup, enter workgroup.
25. Under Computer Description, enter a description of your choice.
26. Select the ACCESS CONTROL tab and then select Choose Share-Level Access Control.
27. Select OK. This closes the Network Pop-up. If you are installing for the first time, more files will be copied to your hard drive. Reboot when prompted.

IV. Configuring the SLIP/PPP Connection

1. Go to Dial-Up Networking under Start/Programs/Accessories.
   Note: If you don't have an icon for Dial-Up Networking in your accessories, select the start button, choose settings, control panel, Add/Remove Programs. Under the Windows Setup tab, double click Communications Tools and then put a check in the Dial-Up Networking item.
2. Select Make New Connection.
3. Enter a definitive name for the connection (e.g., LANL TIG) and select a modem.
4. Configure your modem now if it has not already been configured.
5. Select Next>.
6. Enter one of the following telephone numbers: 667-9020, 667-9021, 667-9022, or 667-9023. The area code is not necessary for a local connection. If you are dialing in from outside of the Los Alamos area, enter 800-443-1461.
7. Select Next>.
8. Select Finish. (Your connection will now appear as an icon in the Dial-Up Networking box.)
9. Click on the icon with your right mouse button.
10. Select Properties.
11. Under the General tab, click the configure button. Set the maximum speed of your modem as follows: 38400 for a 14.4 modem and 115200 for a 28.8 modem.
12. Under Connection tab, preferences should be set as follows:
    a. Data bits: 8
    b. Parity: None
    c. Stop bits: 1
13. Click the Advanced button.
14. Check Use Error Control.
15. Check Use flow control and ensure that Hardware (RTS/CTS) is selected.
16. Select OK.
17. Select the Options tab.
18. Check Display Modem Status.
19. Select OK.
20. Click the Server Type button.
21. Under Type of Dial-Up Server, select PPP: Windows 95, Windows NT 3.5, Internet.
    Note: If the item "SLIP: UNIX Connection" is not in this list of options, then something went wrong when you performed the first step in these instructions. Go back up to "Installation of SLIP Software and Scripting Support" and repeat those steps. Sometimes it takes two or three tries for this to work properly. You don't want to pick the SLIP option, but it needs to be there for the TIG connection to work.

22. Under Allowed Network Protocols, ensure that only TCP/IP is checked.
23. Select the TCP/IP Settings button.
24. Select the Server assigned IP address.
25. Select the Server assigned name server address.
26. Check Use default gateway on remote network.
27. Select OK.
28. Select OK again to exit Server Types.
29. Select OK again to return to Windows 95.
    Note: For convenience sake, you may want to "Click-and-Drag" the connection's icon to your desktop, which will create an easily accessible shortcut to access your connection.

V. Setting Up the TIG Log-in Script

1. Create the script by copying it exactly as shown in the next section (The LANL Dial-Up Script) and then save it to the c:\Program Files\Accessories directory as "lanlppp.scp".
   Note: You can also download the required script (lanlppp.scp) from the Internet and then save it in the accessories directory (http://AtomBoy.lanl.gov/tech/internet/slipin95/default.htm).
2. Go to Dial-Up Scripting Tool under Start/Programs/Accessories, which will open up the Dial-Up Scripting Tool window.
3. Click on lanl tig in the Connections window.
4. Click on Browse under Script File Name.
5. Click on lanlppp.scp.
6. Click on Open, Apply, and Close.
7. Open My Computer.
8. Open Dial-Up Networking.
9. Double click your connection's icon to initiate log in.
10. Fill in your ICN username and password and then click connect.
    Note: For security reasons, you should not check the "remember password" box. If you really need to check this box, talk to your OCSR first.

The LANL Dial-Up Script (lanlppp.scp)

This script will work for Windows 95 and NT 4.0. The script must be copied exactly as it appears below.

```
;
; This is a script file that demonstrates how
; to establish a PPP connection with LANL
;

; Main entry point to script
;
proc main

     transmit "^M"

     waitfor "Username:"
     transmit $USERID
     transmit "^M"

     waitfor "Password:"
     transmit $PASSWORD
     transmit "^M"

     waitfor "tig>"
     transmit "who^M"

     waitfor "tig>"
     transmit "ppp default^M"

endproc
```

Appendix 2. Installation and Configuration of SLIP on the Macintosh

Find the "Network Utilities" disk from the VersaTerm Pro disks. Copy the contents of the following folders to your system folder by dragging the files onto the system folder (the system will then put the files in the appropriate folders within your system folder).

- System Extensions (copy the files: MacTCP,* VersaTerm AdminSLIP, VersaTerm ControlSLIP, VersaTerm SLIP Extension)
- Connection Tools (copy the file: VersaTerm Telnet Tool)
- File Transfer Tools (copy the files: VersaTerm FTP Client Tool, VersaTerm FTP Tool)

*Only copy MacTCP if your computer does not show MacTCP or TCP/IP in the Control Panels folder.

Configuring TCP

NOTE: These changes will affect network connections when using MacTCP.

1. Under the Apple Menu, choose "Control Panels."
2. Open "MacTCP."
3. Select the VersaTerm SLIP icon in the upper part of the window. Click on the "More..." button.
4. Under "Obtain Address:" click in the radio button next to "Manually."
5. Under "Gateway Address" type in: 128.165.7.241.
6. Under "IP Address" set Class to "B"; set "Subnet Mask" to 255.255.255.0 by dragging the handle on the bar to the right until "Bits" reads 16,8,8.
7. Under "Domain" type lanl.gov; under "IP Address" type 128.165.4.4; set as default.
8. Next line under "Domain" type lanl.gov; under "IP Address" type 192.16.1.2.
9. Under "Obtain Address:" click in the radio button next to "Server."
10. Click on the "OK" button.
11. Close MacTCP and restart your Mac for these changes to take affect.

Using TCP/IP

1. Under the Apple Menu, choose "Control Panels."
2. Open "TCP/IP."
3. Under "File" choose "Configurations."
4. Click on the "Duplicate" button; name this new configuration "Slip setup"; click on "OK"; click on "Make Active."
5. Next to "Connect via:" select "VersaTermSLIP."
6. Next to "Configure:" select "Using BootP Server."
7. Next to "Name Server addr:" type 128.165.4.4, hit return key, type 192.16.1.2.
8. Under "Additional Search domains" type lanl.gov.
9. Close the window; save changes.
10. Restart computer so that VersaTerm changes will take affect.

Configuring VersaTermSLIP

1. Under the Apple Menu, choose VersaTerm AdminSLIP.
2. Click on the "Configure" button in AdminSLIP.
3. Name your session in SLIP Server Label.
4. Enter the phone number for the TIG, 667-9022...9024 or 1 800 443-1461.
5. Choose the baud rate that is closest to your modem speed.
6. Under Handshake, choose "None" if you are using an Apple Modem, or RTS&CTS if you are using a Global Village modem. Otherwise, check with the modem's manual.
7. Make sure Type is set to Modem.
8. Click on the "Modem" button. Choose your modem model from the pop-up list, or select one that is similar to your modem. Choose "OK" when finished.
9. Choose OK in the next window.
10. Click on "Script..." (creating a login script)
    a. Uncheck the first <CR> box.

b. Type Username: in the first “Wait For:” box; tab to the “Send Text:” box on the same line; choose “^$ Prompt User” from the “Script” pop-up menu (upper left-hand corner); check the <CR> box.
c. Type Password: in the next “Wait For:” box; tab to the “Send Text:” box on the same line; choose “^$ Prompt Password” from the “Script” pop-up menu (upper left-hand corner); check the <CR> box.
d. Type tig> in the next “Wait For:” box; tab to the “Send Text:” box on the same line; type slip default; check the <CR> box.
e. Type Your IP address in the next “Wait For:” box; tab to the “Send Text:” box on the same line; choose “^# Get IP Address” from the “Script” pop-up menu (upper left-hand corner); check the <CR> box.

Setting up a Terminal Emulation Session

1. Select “New Sessions” from the “Sessions” pull-down menu; a dialog box opens.
2. Type the session name (fore example, “Register”) in the lower left of the dialog box.
3. Click the ”Config” button. A new dialog box will open up.
4. Type the machine name or IP address in the Host TCP/IP address box (for example, “register.lanl.gov”).
5. Click the “OK” button. The second dialog box closes and the first dialog box reopens.
6. Click the “OK” button, and a new session icon should appear on the bottom of your terminal with the other sessions.

To connect to the session, double-click on the session icon of your choice.

Los Alamos
National Laboratory

INTEGRATED COMPUTING NETWORK (ICN) VALIDATION REQUEST

Instructions:

(1) Complete all parts of this form that apply to you. Please take note of the "Special Requirements" section and complete any applicable parts.
(2) Manager (Group Leader or above) authorization and signature are required for all validation requests.
(3) Before submitting this request, ensure that your Employee Information System (EIS) information is current.
(4) Once completed, either mail this request to the Password Office at MS-B251, fax it to (505) 667-9617, or, if you are cleared, handcarry it to TA-3, SM-200, Room 257.

If you have **questions** call (505) 665-1805 or send e-mail to validate@lanl.gov

Owner Information

Z-Number (if you have one)			Name (last, first, middle initial)
LANL Group	Phone Number	LANL Mail Stop	Citizenship (Foreign National see "Special Requirements-Foreign National")

Check LANL affiliation:

- ☐ LANL employee
- ☐ Contractor _____ (specify contract company)
- ☐ External user_____ (specify employer)
- ☐ Other (specify)_____

Send password / smartcard to:

☐ Mail Stop or ☐ Mail to address indicated below

Name / Organization
Address
City, State, Zip Code

Access

Check access method and needed partitions:

Access method: ☐ ICN Password ☐ Smartcard ☐ Both

☐ **Open** partition (e.g., open machines, or for dial up access)

☐ **Administrative** partition (e.g., Travel, Data Warehouse, IA [BUCS, Stores], IB [EIS, FMIS, PAIRS])
If you are not a cleared LANL employee, see required steps in section "Special Requirements-Administrative Partition".

☐ **Secure** partition (i.e., secure machines)
A Q-clearance is required for secure access. After obtaining Manager signature for Secure access, handcarry this form to the Password Office to obtain your Secure account.

I certify this person does require **secure** access:

_____ _____
Manager Signature (Group Leader or above) Date

Password Office Use Only

New ☐ Change ☐	Clearance Status	Processed	Lv	Smartcard Serial #
Comments:				

Form 1646 (3/95) Supersedes previous versions (rev. 4/97).

Continue

Special Requirements

Administrative Partition
Lab-Wide Systems (e.g., Travel, Data Warehouse, IA [BUCS, Stores], IB [EIS, FMIS, PAIRS])

☐ Under 18 years of age

If you need to access Administrative systems, your Group Leader must provide a memo accepting responsibility for your actions and justifying your need for access. This memo is to accompany all forms taken to the security briefing (see "Contractor or Non-Cleared") section below. You may not access the Secure Partition.

☐ Contractor or Non-Cleared

Phone (505) 665-4444 (option #2) to obtain Access Authorization packet.

Phone (505) 667-9153 to schedule a security briefing.

Bring all forms including this ICN Validation Request to the security briefing for approval.

CIC-6 Security Briefing Approval Signature	Date

☐ Foreign National

Attach a copy of Form 982 (REQUEST FOR UNCLASSIFIED VISIT OR ASSIGNMENT BY A FOREIGN NATIONAL) with all approval signatures. Be sure Box #11 of Form 982 is completed. If you are not a visitor/assignee under a LANL/DOE approved Visit / Assignment Request, attach written justification from your host Group Leader or Division Director describing your need to access the ICN.

Authorization (required)

Print Manager Name (Group Leader or above)	Manager Z-Number	Group
Manager Signature (Group Leader or above)	**Mail Stop**	**Date**

If you are NOT a LANL employee you must have a LANL contact and obtain the contact's signature in addition to the contact's manager's signature.

LANL contact: Read the following and sign below.

By signing this form I affirm that I understand and accept the following:

a. I am a regular Laboratory employee.

b. I am responsible for forwarding password reauthorizations and verifying annual account reauthorizations for this user.

c. I am responsible for notifying the Password Office within 10 days of changes in my status.

d. I am responsible for notifying the Password Office immediately of changes in this user's status (termination, end of contract, etc.).

Print LANL Contact Name	Contact Z-Number	Phone Number	Group
LANL Contact Signature		**Mail Stop**	**Date**

NOTE: All Laboratory computers, computing systems, and their associated communication systems are for official business only. By completing this validation request and signing for a password and/or smartcard, you agree not to misuse the ICN. The Laboratory has the responsibility and authority to perodically audit user files.

Please indicate which platform you are using.

_____Macintosh _____PC _____UNIX

Please rank the main uses of your computer and associated computer networks from 1 to 4, with 1 being the main use.

_____administrative _____graphics

_____scientific computation _____word processing

1. The document is logically organized. _____yes _____no

If not, how should it be reorganized?_____

_____

2. It is easy to find what I am looking for in the document. _____yes _____no

If not, how can it be improved? _____

_____

3. The information in the document is easy to understand. _____yes _____no

If not, which information is confusing? _____

_____

4. Terms are defined whenever necessary. _____yes _____no

If not, which terms, and where should they be defined? _____

_____

5. The network paths suggested take me where I need to go._____yes _____no

If not, which ones didn't work? _____

_____

6. The Web addresses take me where I need to go. _____yes _____no

If not, which ones didn't work? _____

_____

7. Would you rather see separate documents for users of Macintoshes, PCs, and UNIX machines? _____yes _____no

Please give us any other comments or complaints you have about this document.

_____

_____

_____

Your name (optional) _____

Your group_____

CIC-6 Customer Service
MS B251
Los Alamos National Laboratory
Los Alamos, NM 87545

We wish to express our appreciation to the many people who contributed information to this issue and to those who gave their time to review its content.

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This second edition of BITS: Introduction to Computing at Los Alamos is designed to provide an overview of the primary computing resources and to serve as a road map to additional information. The regular BITS issue is published monthly to highlight recent computing and communications activities within the Laboratory. We welcome your suggestions and contributions. Both versions of BITS can be accessed electronically via Web browsers such as Netscape. Enter the following URL:

http://www.lanl.gov/Internal/divisions/cic/publications.html

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